The MIDNITE SOFTWARE GAZETTE

The PAPER

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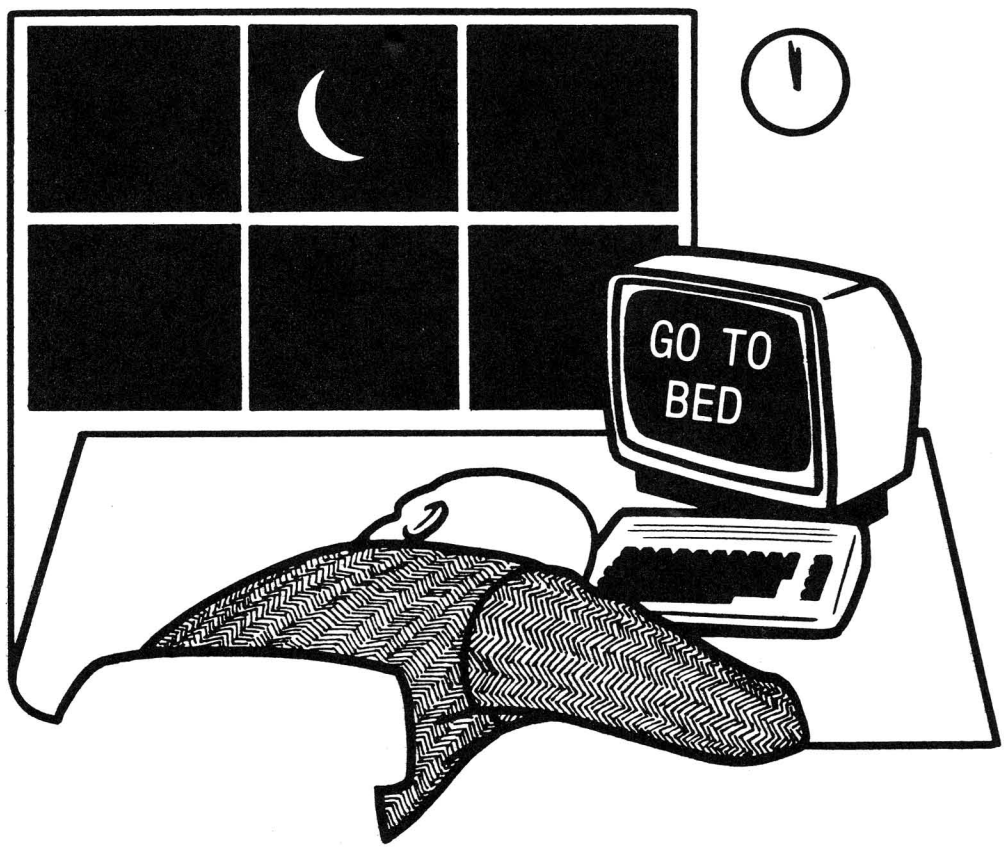

The Independent U.S. magazine for users of Commodore brand computers.

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$3.75 US

for fast development of fast, tight programs...

step beyond FORTH, to

RPL

High speed, low memory requirements, and user-friendly development tools are no longer mutually exclusive. **R**everse **P**olish **L**anguage, a FORTH-like language now available for the PET and CBM computers, is faster than FORTH, easier to debug than BASIC, and more space-efficient than any other language known, including assembly language. Here's what **Loren Wright,** MICRO magazine's PET Vet, says about it:

> **"RPL is generally faster and more conservative of memory than FORTH . . . RPL will serve well the need for a language that is faster than BASIC yet easier to program than assembly language. The package is well-thought-out and well-documented."**

RPL uses the ordinary Commodore BASIC screen editor for program entry and editing. And the full power of BASIC, in both immediate and program modes, remains available to the user throughout a development session. The RPL Compiler and Symbolic Debugger reside in the top 8K of memory, ready to be invoked at any time, directly from BASIC, via the commands "compile" and "debug". RPL source code is saved to disk or cassette just like BASIC source, and is compiled memory-to-memory for quick compilation turnaround and instant source accessibility. RPL supports separate compilation of program modules through the use of the compiler's "global symbol" features, which also permit the development of true "subroutine libraries".

The language itself is concise and straightforward, making it much easier to learn and master than most other computer languages. A total of only 47 special keywords and symbols provide the following capabilities:

- Nestable, multi-line IF . . . THEN . . . ELSE constructs.
- Nestable FOR . . . NEXT loops.
- Named subroutines and functions of arbitrary length.
- Compile-time constants and code ORGability.
- Full 16-bit integer arithmetic and logical manipulations.
- Built-in character-string handling.
- Stack-management directives including n-index, n-rotate.
- GET, INPUT, and PRINT operators
- Forward and backward symbolic references, including GOTO.
- Easy access to machine language.
- Predefined arrays with numeric and/or string contents.
- Local and global symbols.

. . . and *much* more. The 60-page RPL manual is clear and well-organized, making the language easy to learn and easy to use: **Loren Wright** says that **"the documentation is about the best I have ever seen."**

The Samurai RPL Symbolic Debugger is a screen-oriented, object-level debug facility using a soft-key-driven command syntax for ultra-ease of use. Features included are:

- Full visibility into both stacks at all times.
- Single-stepping, with source-level next-step display.
- Breakpointing in both auto-single-step and "go" modes.
- Address specification using expressions with symbols.
- Stack-edit capability on both stacks.
- Debugger video usage is transparent to target program.
- Extra run-time error-checking during debugging only.

. . . and, of course, much more. Here's what **Robert Baker,** author of the PET-pourri column in Kilobaud Microcomputing, says about it:

> **"RPL offers an unbeatable combination of speed, memory space efficiency, and ease of use. It is well-designed, well-implemented, and well-documented, and it deserves the serious consideration of every PET/CBM programmer. The Samurai RPL Symbolic Debugger, in particular, must be seen to be believed."**

The compiler includes a special option making it very easy for you to create "execute-only" object modules from which all development-utility software and memory allocations have been excluded. The price you pay for the compiler also includes an unlimited license to resell the RPL "run-time library" (*not* the compiler) in conjunction with "execute-only" application object modules of your own.

The Samurai RPL Compiler is now available at the special introductory price of $49.95, which includes the manual in a nice 3-ring binder and First Class postage within the continental U.S. Media supplied is of top quality, and is *not* copy-protected (this permits you to make backups for yourself without hassles). Compiler and debugger together are **$80.91, complete.** Manuals are available separately at $10.00 and $4.00, respectively, and will be credited toward software purchase. Please specify machine type, memory size, ROM version, and media type (cassette, 4040, or 8050 diskette) when ordering.

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The Midnite Software Gazette was published quarterly from September 1980 to July 1982 by members of the Central Illinois PET Users Group, and paid for by donations and ads. It went to all who provided stamped self-addressed envelopes. Beginning with this issue, the Midnite also goes to subscribers of The PAPER, one of the first PET resources, adopting their subcription policies. This means:

* The Midnite/PAPER is published bi-monthly by Midnite Software, Inc.
* Subscriptions cost $20 (US) via first class mail in the U.S., $25 (CDN) in Canada, $30 by surface mail overseas, and $40 via air mail overseas.
* Pre-paid camera-ready advertisements now cost $100 per page.
* Orders of 6+ copies to one address are welcome, at one-half cost.
* The Midnite/PAPER now also accepts articles, as well as reviews.
* The Midnite/PAPER has the large format and type of The PAPER.

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Several names are abbreviated throughout this issue: Brent Anderson (BA), Ralph Bressler (RB), Jim Fowler (JF), Jerry Key (JK), Amie Lowe (AL), Mark Niggemann (MN), Jim Oldfield (JO), Jim (JS) and Ellen (ES) Strasma, Chris Werth (CW), and Larry Woolard (LW). We also thank all those whose names appear beside their comments and reviews for their help.

****

MIDNITE MEANDERINGS

WELCOME TO...

Welcome to issue 9 of Midnite Software Gazette. Welcome also to Vol. 4, no. 5 of The PAPER. You received this because you sent stamped envelopes requesting the Midnite, you subscribed to The PAPER, or we hope you'll subscribe to the new Midnite/PAPER. Don't worry, the envelopes didn't go to waste. Picture, if you will, publisher Oldfield soaking in his bath, surrounded by sopping wet envelopes, removing stamps to mail the new Midnite!

Naturally, there are complications. Subscribers to The PAPER will get one more issue free, courtesy of Ralph Bressler, out of your volume 4 subscription fees. You must then re-subscribe. Those having made significant gifts to Midnite can also receive later issues in thanks only if you request this. Otherwise, we assume gifts were for past costs. For those who have received the Midnite or The PAPER as a courtesy, this is your last issue. We can't justify charging some over $3 an issue, while others get it free.

Notice what you've gained: No more tiny type, no more crease down the page, no more remembering to send stamped envelopes. Instead, you've got full-size pages fastened together durably, six issues a year instead of four, a new

articles section edited by Ralph Bressler, and professional illustrations. You also retain one of our best features, first class delivery. It's why we cost more per issue than Compute! -- but it's also very fast and reliable. In two years, we've only had 2 Midnite's returned. Our church newsletter, on the other hand, averages two changes of address a month out of 305 familes.

If you haven't yet, please send us a check for your subscription now. In North America, send $20 US or $25 CDN. Overseas, send $30 US for surface mail or $40 US for airmail (overseas prices are outrageous, but barely cover postage).

SURGERY AT MIDNITE:

We have always tried to publish everything we receive for Midnite. Mind you, few escape the editorial knife, but everything gets in. Unfortunately, that would require 100 pages this time, and we can only afford 48. We hope the leftovers will fit next time. But perhaps not, as new material arrives daily. The cure is more subscriptions. Remember, our workers are still waiting for their first dollar, and other available jobs WOULD pay.-JS

NEW ADDRESS FOR THE STRASMA'S:

Jim and Ellen Strasma have a new address. Jim has accepted a special clergy appointment to Lincoln College in Lincoln, IL. He is teaching computer science there and at nearby Logan Prison. To contact them, write to:

R/M Jim & Ellen Strasma		
Midnite Software, Inc.	or at:	Lincoln College
1280 Richland Av.		300 Keokuk St.
Lincoln IL 62656 USA		Lincoln IL 62656 USA
217/735-2703		217/732-3155x289

Please include a stamped reply envelope if you need a personal answer.

CONTEST MARKS MERGER:

To celebrate the merger with The PAPER, a contest is underway to rename the merged magazines. The person suggesting the best name (whether adopted or not) will receive a free VIC computer, courtesy of Computer Country of Springfield, Illinois. Judging will be by the editors, and in case of ties, by subscribers. (Ralph Bressler urges you to vote for our temporary name, Midnite/PAPER). Send your entries by Nov. 1, 1982, to: Midnite/PAPER, 635 Maple, Mt. Zion, IL 62549.

WHITHER TORPET?

Is it over? The Toronto PET user group newsletter has included Midnite from their very first issue (November, 1980), but we've just learned Midnite will no longer be printed in Torpet. We find this distressing. For one thing, Midnite has been the primary content of TorPET. For another, breaking with TorPET costs us over half our readers. But most important, we haven't said goodbye. The printed notice is a brief paragraph, nestled among descriptions of competing PET magazines. Is that any way to treat a friend whose free labor helped earn thousands of dollars? This is not our decision. Some 3,500 newsletters containing the notice were printed before we or TorPET editor, Chris Bennett, learned of the change. We are told it's for our own good, so TorPET readers will subscribe to Midnite. I hope so, but all we feel is pain. If this is goodbye, let's say it properly, with this issue I'm sending Chris Bennett for the next TorPET. I hope that TorPET readers WILL choose to stay with us in the coming year by subscribing to the Midnite/PAPER.-JS

TRIVIA: WHAT DO YOU DO WITH AN OLD MIDNITE?

We recently received a diskette from MN, who fabricated its envelope from Midnite 7! Oh well...-JS

ATUG NOTES

by Brent Anderson, ATUG Librarian
200 S. Century
Rantoul IL 61866 USA

As your Asm/Ted Users Group (ATUG) Librarian, I gather, organize, help document, and distribute useful PET/CBM "public domain" diskette files containing BASIC and machine code programming, WORDPRO documentation, and "source code" files that PET assembler packages can edit and translate into machine code. We SPECIALIZE in SOURCE files for CARL MOSER'S ASSEMBLERS for PET (MAE, Asm/Ted, and MacroTeA sold by Eastern House Software, Skyles Electric Works, and others). You're a "member" by ordering ATUG diskettes in either 4040 or 8050 format, and especially by contributing useful public domain material. To obtain ATUG diskettes, send $10 PER DISKETTE to the above address. I now have an 8050 Disk Drive. Thank you, Bob Baker, for handling 8050 diskettes in the past!

15 OFFICIAL ATUG DISKETTES as of 9/82:

The Whole PET Catalog contains a recent annotated directory of all diskette contents. They include diskette ID numbers UA, UB, UC, UD, UE, UF, UG, UH (includes POWER AID), UI, UJ, UK, UM, UV, UX and C2. To receive the latest annotated directory of ATUG Diskettes, send a letter- sized, double-stamped SASE and request ATUG INFO.

EVEN IF YOU DON'T OWN AN ASSEMBLER, we also have available over 20 diskettes of mixed material, provided 'as is'. They include 1) CEAB #1 thru #7 (Canada Education Advisory Board) on 6 4040-format diskettes, 2) FINZER ONE (1 disk of Education programs), 3) 1 HELP diskette (BASIC and source files for the 3rd edition of the Osborne CBM and PET guides), 4) 1 O'VENTURES diskette from a group member, and 5) 12 monthly Toronto PET Users Group (TPUG) diskettes, which I am gradually documenting, including tpug #1 (12/80), #2/bus #1 , #3 (2/81), t4 (3/81), #5/#6, nov/81, dec/81, jan/82, feb/82, mar/82, apr/82 - newly annotated, may/82, and utilities #1/#2.

We have the following NEW diskette!:

(PD) Commodore 64 Exchange Diskette
(It does NOT require an assembler, but does require a CBM 64!)

The following diskettes have been REVISED:

(C2) Campbell#2 (Asm/Ted adapted for MAE disk files). ***Restriction: you must include proof you own cassette-based ASM/TED or Skyles MacroTEA, such as the serial # on your manual.***

(UA) atug.sourcel: PET MAE source files

(UD) atug-directions: Documents ATUG Files (UA-UG)

(UE) atug asm #2: Has NEW TINY PILOT version for BASIC 4

(UM) mail list: This 7/19/82 version fixes some earlier bugs.

(UX) xtnd monitor: This 8/82 revision corrects a flaw in the way previous MICROMON 'E's stored important vectors, to keep you from occasionally losing control of your PET.

HELP disk (7/19/82 version) updates the "mail list 4040" program.

The ATUG exchange library constantly increases, with your help. This summer I received source and object code for bsr appliance controller, disk disassembler (Rockwell version), hexadecimal input purely from the numeric keypad, machine language "program compactor," machine language addition/subtraction of very larger numbers, and some religious programs. These programs will be forming new ATUG diskettes and additions to existing ones.

CBM/PET PROGRAMMING NOTES

Helpful Hints:

ON BLANKING THE 8Ø32 SCREEN:

Try POKE59520,1:POKE59521,Ø to blank the screen and POKE59520,1:POKE59521,40 to restore it to normal.-JK

ON ANNOTATING DISK FILE NAMES:

Would you like to add a comment after disk file names in the directory? Simply include a SHIFTED-SPACE character in the file name. Once in the directory, the SHIFTED-SPACE will be replaced by the closing quote of the file name, and whatever followed SHIFT-SPACE in the original name will appear after the directory entry. Here is an example:

```
If you type in:      dsave "name[SHIFT-SPACE]comment"
Directory reads:     XX "name"comment      prg
```

Note that it is possible, via this technique, to write two files with the same name. This makes the second one inaccessible unless a SHIFTED-SPACE is again used in the DLOAD command.-KRP

ON MONITORING CASSETTE FILES:

There is a simple way to discover how data is feeding to and from the tape. Place a radio that has TV bands near your PET. While a tape is Loading, tune around the lower end of the LOW TV band. You will hear the data. After practicing with SAVEing and LOADing programs and data files, you will become familiar with them, plus having an excellent monitoring system. For example, you will know immediately if you are trying to load a blank tape.-Norman Girard

Handling Those Pesky "Bugs":

CBM 64 BUGS:

Jim Halsey of Execom Corp. sent JS a list of bugs in the '64'. One of them, a difference in the way the line-wrap works at the end of a line, is actually a vast improvement over PET BASIC. No longer will a following line accidentally become attached to the line you're using, a 'feature' that really upsets beginning PET users. Instead, as Jim noted, a new line is inserted just below the one in use. Jim also reports, "PRINT FRE(X) gives a minus 26627 on power-up. If you enter code, the free space numbers get more negative." This is true, and it is a cost of having more free memory than an integer number can properly address. It is similar to Apple having users use CALL(-151) to get to their monitor. To see the correct amount of memory free on a 64 takes a bit more work now. Here is a line that usually works:

```
1Ø memleft=fre(x):if memleft<Ø then memleft=65535+memleft
```

The exception would be situations when PET BASIC would also report negative memory free, such as after loading a ROM image into a 32K PET with DLOAD. Typing NEW after the load is the cure for these exceptions.

Halsey has also found a fatal bug in the 64's screen editor. As he says, "If you're on the 23rd, 24th or 25th line of the display, with anything else displayed above that line on the screen, and type a BASIC DATA or REM line longer than 8Ø characters, but less than 12Ø characters (using the screen wrap function), and try to delete the 8Øth character, the system tries to do an auto load and run. If there is a program present, the program will run and seem to 'hang'. If there is no program present, it just 'hangs' the system. In other words, if there is a program resident, it will run, but cannot be stopped with

the stop key. If there is no program resident, then the keyboard is disabled. The fix for this is going to have to come from Commodore, because they are using 8k ROMs (2 of them soldered in) for the operating system. Personally, I feel they should replace the existing ROM (part number 901227-01 located at U4) at no charge to existing owners."

"Commodore is aware of these 'bugs' and I hope, going to do something about them. I contacted them on August 30th, and again August 31. I did receive a return call, from a secretary. This would mean there is possible hope for their 'new' look, as far as customer support is concerned."-Jim Halsey

BASIC AID BUG:

Users of the 1019 version of BASIC-AID may cause themselves trouble using the CONCAT command, if they use file names over 12 characters in length. The fix is to 1) shorten names before using CONCAT, or 2) KILL BASIC-AID before using CONCAT, or 3) reassemble BASIC-AID using $038C as the start of the variable area instead of $0380. To see which version you have, view the last four bytes of the BASIC AID code; they contain the revision date. On ATUG and HELP disks, the date is also part of the file name on the directory.-JS

WORDPRO HINTS:

Reader Carl Cohen has called our attention to a "bug" in WORDPRO 4+" that kicks it into continuous mode when restarting a global output from the top of the current page. He asked if there is another way to restart, without going into continuous mode. The latest version of WP 4++ has more lines for main text, a 4-column selective directory, and other improvements, which may solve Carl's problem. Meanwhile, here's the method we use at Midnite:

1) I start every linked series of files with one containing only the format commands (margins, header, footer, etc.) I'll say why in a moment.

2) When the error occurs, I halt the output. The file containing the top of the page containing the error is then either in memory or in one just past. If not already in memory, I then reload it.

3) Now delete the top of the offender file, down to the beginning of the text of the offender page.

4) Save the altered file under the name "temp".

5) Load the header file. Change the "nx" destination link to "temp". Also add the format command "p#XX", where XX=the first page number in the part to be redone.

6) Save the altered header file under the name "temp head"

7) Do a global output, starting with temp head.

8) when finished, do "[control].s0:temp*" to scratch the temp files (assuming they are on drive zero).

I'm sure this method will work for single sheets. To halt on a given page, either hit [control] instead of "c" at the end of the last page desired. Or else set up another temporary file that ends there, and point the prior link to it instead of the usual destination. With these techniques, we've easily printed three books in the past year, and are still very pleased with WORDPRO.-JS

CBM 64 NOTES

by Ken Penny

Welcome to the adventures of Max Maxwell, Electronic Private Eye. In telling his story, these pages will soon speak to that question of questions, "What is a 64 and why is everyone saying those wonderful things about it?"

The CBM 64 is an exciting new product for many reasons. It is a true extension of the Commodore line, unlike the SuperPET and more so than the VIC. Those of you who are familiar with BASIC 2 or 4 will only need to modify your thinking, not start over. Those of you who are just starting with the 64 will find a great body of information and programs already collected for the 64.

This series of articles is written for relatively knowledgable users of Commodore Computers. We will assume, for instance, that you know BASIC lines need line numbers and that [clear/home] is a button on the keyboard, not a command, but that 'pha pha rts' is NOT yet part of your daily vocabulary. We hope it will help bring you to a greater level of understanding of the CBM 64, to the mutual benefit of both you and your 64. Now, to our story....

The Adventures of Max Maxwell, Electronic Private Eye

Max Maxwell, private eye, picks up the Video Tape behind the privacy fence at the home of Moose Morley, well known midget. He takes it to The Video Source to read the message. The tape is found to be blank, except for the words, 'CBM64 arriving first flight: analyze & report!' Video Source's best VCR self destructs as Max slips out the side door.....

DAY ONE: The 64 Wonders of the CBM 64

NIGHT ONE, 10:34 PM:

A box arrives mysteriously in the laboratory of super sleuth Max Maxwell, Max Squared for short. His mission: determine why this electronic device makes people forget their budgets, wives and old habit of sleeping at night. He cracks open the box under an intense ultraviolet light....

Funny thing about a CBM 64 - it looks like a VIC, but it's not. It uses some of the same technology, but is much more than 'a VIC with lots of memory'.

A good analogy is that a VIC is like a Volkswagen while a CBM 64 is a Porshe. Both do about the same job, but the greater of the two does it with more options, more possibilities, and perhaps a little more class. For a trip to the corner store, each is capable, but for that quarter mile drag, for those laps at Riverside Raceway, for merging on the freeway, certain differences appear.

So what does a 64 have that makes it the Porshe of computers? The answer is VIC, SPRITE, SID and more. There is also the RAM, alternate processor, I/O, and more, but these three are a good start.

VIC:

VIC stands for Video Interface Chip. It handles the interface between the computer and screen. All screen activity used to be done by the main processor, but the VIC chip does it differently.

The VIC chip is a separate circuit that looks at the same memory that the main processor does, like the old PET, but with much more intelligence. The normal screen location in memory is $0400 to $0800, but because of the intelligence of the VIC chip, it can be moved to any location in memory.

In the bells and whistles department, the VIC chip won't let you down. It puts out 16 colors, with high resolution graphics of 320 bits by 200 bits. It

allows programmable characters, direct light pen interfacing, and a smooth scrolling mode, with both up/down and right/left scrolling options.

SPRITES:

The VIC chip also takes care of other things, like Sprites. Sprites are a little like a programmable character, but much more flexible. For example, a sprite may be defined as a certain shape, perhaps a spaceship. Once it is defined, just two pokes will cause the VIC chip to move the sprite to a new location. The VIC chip also lets you know if your sprite has hit anything.

Eight sprites may be defined at one time. They have priority, from Ø to 7, so that sprite Ø, if intersecting with sprite 1, will appear to be in front of sprite 1. Similarily, sprite 1 will pass in front of sprite 2. Sprites are defined in a 24 by 21 matrix, and may be expanded in either dimension, or both. They are located within a rectangular coordinate system of about 36Ø by 242.

SID:

Speaking of separate chips, the SID is a prime example of just what can be done when some of the special chores are handled outside the main processor. SID stands for Sound Interface Device, interfacing the 64 with your ears. The SID has been likened to a mini-Moog on a chip. This is because it is completely programmable in many parameters. The huge number of combinations make the number of possible sounds truly incredible.

The SID has three voices. Each voice is controllable in frequency, attack, decay, sustain, release, wave form, and volume. The SID also has a programmable filter, variable resonance, and auxilury input (for mixing). The voice range is not quite as great as the old CB2 sound on the PET, but the tonal quality is something you really must hear to believe.

The SID, VIC and SPRITES will get closer scrutiny in later issues.

OTHER INTERESTING FEATURES:

There is the 64K RAM that we keep hearing about. Two joystick ports grace the starboard side of the case (two joysticks or four paddles). A very good modu lator built into the case lets you plug your RCA connector video cable right in with no extra black boxes (except the switcher up by the antenna jack). A switch on the back lets you choose between channels 3 and 4.

Because most of the power supply circuitry is in the remote power supply, the 64 tends to run cooler than the VIC. This means that the power supplies are different, with a DIN plug instead of an AC type plug.

The cartridge slot is much smaller, and very different in design. Thus, VIC plug-ins may not be used in the 64. However, this new design does allow one interesting option: CP/M. The rumored price is $3ØØ ($1ØØ for the hardware and $2ØØ for the CP/M software itself).

The user port is still there, as is the cassette port. Cassette operation is slightly different due to some timing considerations with the VIC Chip, but the regular C2N cassette drive works just fine.

That's a quick overview. The next issue will be about 64 peripherals and their compatability with the Commodore line.

NIGHT ONE, 2:47 AM:

Police headquarters received a call from one Jessica Roberts complaining of a 417, loud party in progress. Officers arrived at the address to find loud music issuing from the labratory vent of our Max Squared. When informed that the noise was the arcade sounds of the new 'singing space invaders' game, Jessica was passified with the promise of three plays of said game each night for the next 1Ø weeks. Case closed.....

COMMODORE NOTES

ON PRICES:

Commodore had good news for dealers and customers August 17. Prices on several items were significantly reduced. Included were all three printers: the 4022P dropped from $795 to $495, the 8023P from $995 to $795, and the 8300P from $2250 to $1995. Also dropping in retail price was the 1541 single disk drive, from $595 to $395. Although the retail price of the VIC remains unchanged, its dealer cost was also reduced. Unfortunately, one other item was dropped — the 4016 is no more. So far the 4032 is still in production, despite rumours to the contrary. However, we have heard an interesting rumour about a new model using the 4032 video tube and case with the keyboard and main board of the 64, for a price between those of the 64 and 4032. It would be a highly welcome model in the school market, where hiding cables inside the case is initially far more important than a color display.-JS

ON SALES:

According to a June issue of the Chicago Tribune, an amazing thing has happened: Commodore is now outselling Apple (and everybody else), not only world-wide. The Trib credited Commodore with about 40% of the U.S. market in dollar sales, and said it also leads in units sold.-JS

ON EMULATORS FOR THE 64:

A preliminary copy of the PET emulator for the CBM 64 is being distributed by Commodore dealer reps. It is rumored that more features will be added later. Even this preliminary version is very impressive. In several hours of testing Cursor programs, we only found one which did not work UNCHANGED on a 64 with emulator. This includes such difficult items as zero-page pokes, screen pokes, and CB2 sound. The only feature often used in PET programs, but missing on the VIC and 64, is a numeric keypad. In a rumored new version of the PET emulator, the joystick may replace the numeric keypad. This would be highly fitting, since Cursor programs use the keypad primarily as a joystick! The Emulator also includes the DOS wedge, providing BASIC 4.0 disk commands lacking in the 64.

Apparently the dealer reps were also given a 64 version of the Commodore assembler and editor and enough other stuff to fill 4 or 5 diskettes.

According to another rumour, UMI is also developing an emulator for the 64 that allows it to run VIC programs and cartridges. Considering the flood of games available for VIC now, this would be a welcome offering.

Peter Smith of Richvale Telecommunications in Toronto reports his company has already developed an IEEE interface for the 64, and we've heard the same about companies in the U.S. and Germany. We've ordered Peter's interface and hope it arrives in time to report on next issue.

As if that wern't enough, we also understand The Computer Works went to the San Jose computer fair with still another emulator for the 64. Apparently for about $75, it temporarily alters the 1541 VIC disk to read APPLE and TANDY diskettes. Since the 64 can match the Apple II feature for feature, this should be a VERY popular product. However, don't try to buy it just yet. Several large companies are trying to buy the rights to it. Do you suppose the bidders could include Apple or Tandy?

Based on these rumours and what we hear from other software suppliers, the 64 should be floating away in good software within 6 months. The only dark cloud on the horizon is that, supposedly, Commodore recently fired several programmers for wanting a royalty on cartridge games. Three chip designers at MOS may also have left. This may slow the introduction of new chips and programs.-JS

ON CBM WOES:

We hear so often about the woes of people dealing with Commodore that we forget Commodore also has its troubles. For instance, CBM staffers are currently upset about a rumour circulating in the Texas area that a particular former Commodore employee holds the patents to the VIC, and was somehow beaten out of his due. I have good reason to believe that this is a false rumour. The VIC as we know it was designed by Bill Seiler, assisted by Chuck Peddle. I remember chatting about it with Bill at the time, and I have recently verified it with another "Old-timer", Bob Fairbairn.

Another CBM woe is dealers who fudge in explaining why they no longer sell Commodore equipment. There is, for example, a big difference between dropping Commodore, and being dropped by Commodore.

Along the same lines, I got a big chuckle out of the current issue of Computer Retailer. A ComputerLand dealer is quoted as saying he dropped Commodore because "software was a major problem and it never made it as a personal machine. It just couldn't compete with Apple." But then later in the article, the same dealer is quoted again, saying, "Right now the VIC-20 is in a toy store and K-Mart and Minnesota Fats (a cut-rate department store.)" Is it really that VIC can't compete with Apple, or is it that ComputerLand can't compete with K-Mart?

Of all CBM's woes, the "no software" reputation has to be the worst. Again and again we hear this complaint, especially from teachers and video game freaks. I made a quick count tonight--my library includes at least 350 diskettes, with at least fifteen devoted to education, and another fifteen to games, even though my interest in these is low. How many programs does one need? And surely it hasn't escaped EVERYone's attention that CBM versions of UCSD PASCAL and VISICALC are better than Apple II Equivalents, not to mention how much better WORD PRO is than APPLE WRITER and SCRIPSIT.-JS

COMPETITOR NOTES

The new battleground of Personal Computer sales is department stores. According to a recent article in Computer Retailing, Atari, Tandy, Commodore, Texas Instruments, NEC, Panasonic and Sinclair are running this race, and there is room for perhaps 6 survivors, with 3-4 dominant.

Who's winning? It's the Atari 400, according to MicroPro's Will Luden, who calls the TI 99/4A a high end learning aid, and says Commodore is close to Atari. Atari recently reduced the price of the 400 by $50. According to Yankee Group's Clive Smith, this indicates weakness; the computer has "a lousy keyboard and a lousy upper range" of memory. Atari is supposedly planning a new 600 model for sometime in '83.

Smith also says Commodore's share of the market will increase substantially from the "3,000 outlets the company had at the start of the year because of recent sales agreements with K-Mart...Woolco...and Toys-R-Us." [also Wards-ED.]

Radio Shack, which was number 2 last year, has 8,000 outlets, but warns Portia Isaacson of Future Computing, "Radio Shack is losing the edge." To their credit, Tandy has hired a credible answer to Commodore's "Admiral Kirk" as spokesman--Isaac Asimov, grand old man of American science fiction.

Xerox, reports the Wall Street Journal, "botched" its entry into the low-end personal computer market with a since-replaced 820. According to David Kearnes, president, "We botched up our entry into the personal computer business, and it cost us more than we had expected." The loss, according to EN, July 19, was $90 million last year. Xerox admits this year's losses are even higher.

IBM, on the other hand, seems to be doing fine, and finally making enough PC's to offer them to a few dealers other than Sears and Computerland.-JS

COPYRIGHT NOTES

NO MORE "COPY ME, I WANT TO TRAVEL"?:

Alert readers will notice something new about our page headers. First, we're making a special effort to get the issue number correct for a change. Beyond that, the phrase "Copy Me, I Want to Travel" no longer appears on each page. We can't both charge a subscription fee and encourage widespread copying. We still don't mind if you copy a few pages for a few friends. That almost amounts to free advertising. However, if the Midnite/PAPER doesn't earn enough to pay its staff what we could earn elsewhere, then it will be discontinued. We printed a thousand copies of this first issue in the new format. If any remain at the end of the year, we fold. Very simple.

That leaves those of you with free access to copiers in a dilemna. Either you pay more per page than it costs to copy us, or there will be nothing to copy. Need we remind you we are the last independent all-Commodore magazine in the U.S.? If you got this issue courtesy of Brother Xerox, how about subscribing?

WHO IS SUING WHOM THIS MONTH?:

Astrocade, a Columbus OH company is suing both Atari and Commodore for their use of bit mapping in video games. Apparently, Astrocade markets what was once known as the Bally Arcade video game. Bally itself declined to enter the suit, and has an agreement with Commodore that allows Commodore to use Bally games. Atari, in turn, has a similar arrangement with Lucasfilms (of Star Wars fame).

HERE IT COMES, THE ANTI-WARRANTY!:

Last year I wrote a very negative unpublished software review. My main complaint then was that the printed warranty was totally unacceptable. At the time, I thought it was unique, but now I find similar words on a new product from a company we've dealt with happily for years. If users tolerate its "disclaimer of warranty", I know we'll see more like it.

According to a recent article in Computer Retailer, a product or program sold without a warranty is usually covered by an implied warranty of "merchantability". This requires that a product "be fit for the ordinary purposes for which such goods are used." However, some states allow companies to disclaim this implied warranty, because liability is becoming a real problem, even for software houses. Companies try to avoid liability with carefully worded warranties.

Here is a slightly edited copy of the current "anti-warranty":

> Warranty Disclaimer
>
> Although the enclosed programs are carefully tested prior to release, the program, and files which are included on the floppy diskette, and the ROM device, as well as this documentation are provided to the purchaser with no warranty of any kind. No representation is made about these products' fitness for any use or about the accuracy of their operation. The manufacturer, its distributors, retailers, and representatives therefore assume no liability arising from the use of these programs.

To their credit, the sellers tested the product; not everyone does. However, if the diskette arrived folded in half, with all the pins broken off the ROM, and the manual completely blank, their legal position could be "you bought it; it's yours." Indeed, they DENY the program is good for anything, let alone accurate. They also refuse liability for nasty results of using the product.

This anti-warranty might not stand up in court. One reason is the user can't read it until AFTER buying the product. Another is that it lacks the word "merchantability". Users might also have two other hopes: first, some states don't allow anti-warranties (the automatic warranty still applies), and second,

you may be able to force the company to live up to advertising claims. Perhaps one of our many lawyer readers will say more on this subject next time. Meanwhile, don't buy anti-warrantied products until you are happy with your copy "as is". If it turns out to be defective, contact the company. They may provide more support than the disclaimer would indicate.-JS

DEALER NOTES

ECLECTIC SYSTEMS CORPORATION:

Oops! I misunderstood Jerry Key's comments in The Whole PET Catalog. Sorry, Jerry!-ES. As corrected, review #2 should have said: "Rockwell employees who buy their own equipment on the company plan actually received their equipment from ECLECTIC SYSTEMS CORPORATION, but frequently don't receive the accompanying Osborne/McGraw Hill manual with it! Not receiving everything Commodore packs with their computers seems like underhanded dealing to me..."-JK

GREAT WESTERN SOFTWARE:

For those of you trying to track down Paul T. Eckert's BASIC Pseudo-Source Code, he is now located in Fort Worth, Texas. His new address is: The Great Western Software Co., Attn: Paul T. Eckert, 2520 McKinley Avenue, Fort Worth TX 76106 (phone:817/625-7357).-ES

DISK NOTES

FIXING BAD DISKETTES :

If you have an aggravating diskette with some bad sectors, first copy the good files to a new diskette. Then use an electrically powered bulk tape eraser to clean the offending diskette. After using this on two bad diskettes, I was able to HEADER, BACKUP, and COPY with no further problems.-BA

EDUCATION NOTES

EDUCATIONAL RESOURCE CENTERS:

Commodore is now broadening their coverage of the educational aspects of the microcomputer business. If you receive Commodore magazine, you've seen their call for educators to join. As their ad says: "Commodore wants to create a spirit of cooperation with institutions and microcomputer laboratories where Commodore products are used for education applications. The end result of this combined effort will be the creation of EDUCATIONAL RESOURCE CENTERS throughout the country." (Apr/May issue, 1982)-JO

Have any of you readers become a part of this network yet? So far, we haven't heard of anyone who has, or what function these centers are supposed to perform. Meanwhile, see the Educational Resources notebook review later on.-ES

NO MORE THREE FOR TWO, BUT...:

The three for two educational deals are now defunct. Instead, all approved educational institutions get a 10% reduction on the cost of equipment. It isn't much, but it's something.-JO

DUMP MATE:

If you need to dump a program from one PET to several others, get a copy of TRANSACTOR V3, I4. Our Canadian friends have a device called DUMP MATE, which not only does that, but is also an audio-video interface.-R. Dale Connely

HAM NOTES

by Clark L. Stewart, W8TN
104 Henrietta St.
Ravenswood WV 26164

For those ham PET users who have not yet received the three newsletters and the HAM PUG address list which I have prepared, please send a large SASE with $0.37 postage to me at the above address. Please indicate by letter that you want the HAM PUG (Ham PET Users Group) List, and include the appropriate information if you want to be listed in or receive future mailings of these newsletters.

There are at least two PET NETs presently on the air: Saturdays beginning at 8:30 a.m. Eastern Time on 7.156 MHz and Sundays at 12 Noon Central Time on 14.240 MHz. Both nets juggle the frequency to get around the QRM.

I have more good news for those of you with the Macrotronics RTTY program. VE3BLL has modified the program to run on 4.0 BASIC. If you want him to upgrade your copy to 4.0, send it on either cassette or 4040 diskette to Jack at: P.O. Box 563, Lakefield, ONTARIO K0L 2H0, CANADA. Please include sufficient Canadian postage (or IRC's) for him to return your program. For the same program, K4EVY still has his machine language subroutine which allows you to get hard copy. However, Hank has moved back to North Carolina and his address is now: 6408 Secret Drive, Raleigh, NC 27612.

A late note from WA2YNT says that he has acquired a Kantronics CW-RTTY-ASCII interface for his VIC-20. Bob reports that both the hardware and software work well and contain many features similar to the Macrotonics program.

Those of you having anything of interest to ham PET users are invited to send it to me, but please enclose an SASE if you wish a reply.-73, de W8TN

MODEM NOTES

COMPUSERVE'S COMMODORE NETWORK:

I recently saw a demonstration of the Commodore bulletin board offerings on COMPUSERVE. They are quite impressive! When you have a LOT of time to kill, take a look at the huge volume of information there. One bulletin board is a HELP service, in which users ask questions and find answers the next day. However, my guide frequently finds his questions answered before he finishes using the system. Hundred of questions on this board are answered by Commodore employees, who consult experts as needed. Surprisingly, many users ask the same questions, without even reading answers given to others.

For those with lots of paper (and money!), 100 pages of technical hints are available on another bulletin board. Anyone in need of customer support from Commodore would be well advised to get a modem and sign on to COMPUSERVE.-JS

COMPUSERVE'S CB NETWORK:

COMPUSERVE also has two other good ideas. One is a paged menu access system. This allows beginners to get anywhere in the system by going from one menu to another. However, each page accessed also has a page number, allowing skilled users to go directly to particular spots.

The other good idea is the CB network. It works much like CB radios, but without static, and with everyone having an equal chance to talk. The only problem is keeping track of several conversations simultaneously on a swiftly-scrolling screen. This was especially noticeable on a channel somewhat comparable to channel 19 on CB radios, except this time the attraction is "eros," not truckers. It certainly seemed foolish to watch a dozen or more people trying to be sexy via keyboard, when separated by thousands of miles of wire. I doubt if I would use the CB network; I can talk more quickly than I can type.

Electronic mail, on the other hand, makes a lot of sense, because the recipient can call in to check mail from anywhere, 24 hours a day.-JS

PET BULLETIN BOARD SYSTEMS:

For those of you just learning about modems and bulletin boards (like me), I just discovered that a 'sysop' is the person running a specific bulletin board system (that's right, it's the abbreviation for 'system' and 'operator').-ES

READER QUESTIONS AND COMMENTS

QUOTEABLE QUOTES:

"The President's Science Advisory Committee report is as appropriate today as it was when it was presented in 1967. 'After growing wildly for years, the field of computing now appears to be approaching its infancy'."-Quoted by Doug Jones in Computer Retailing

RE: NMI SOFT RESET SWITCH:

Reader, York Lam writes, "I am wondering if an uncrasher can be made by using only the parallel user port?"

The answer is no. Neither the RESet signal nor NMI is brought out to that port in PET or CBM models. On the other hand, it is easy to make an uncrasher that doesn't use the parallel port at all. The diagnostic reset line that such switches usually trap there can just as easily be trapped at the memory expansion port, using pin A20 on connector J9. Making an uncrasher is described in our new third edition of Osborne/McGraw-Hill's CBM and PET Guides.-JS

RE: VIC HARD RESET SWITCH:

Resetting is mainly used in debugging machine language programs. You can use it with BASIC, but you'll need to UN-NEW the program. An excellent article that explains this in better detail is found in Compute!, no.24 (p.135).

You may press the RUN/STOP and RESTORE keys together on a VIC to get out of a crash if you work with BASIC. However, if you work with machine language, it's a whole different game: the RESTORE key rarely works! You can remedy this by wiring in a reset switch. Memory will not be wiped out, because the memory testing routine is non-destructive!

There are 3 places on the VIC where you can wire a reset switch. I mounted mine next to the memory port and ended up drilling a hole in the case, voiding the warrantee. A better place to mount the switch is on a 24 pin edge connector connected to the user port. Run one wire from the switch to the RESET line and run the other wire to GND.-Mark Niggemann

RE: 64 RESET SWITCH:

Jim Halsey of Execom Inc. has figured out how to add a RESET switch to the '64. He explained it to me on the phone, but JS couldn't make sense of the notes. Contact Halsey if you need this.-ES

USER GROUP NOTES

NATION-WIDE SPECIAL INTEREST GROUPS:

CASSETTE TAPE-ORIENTED USER GROUPS:

Jim Cychler of Ann Arbor, MI, asks, "Is there any PET Public Domain cassette tape exchange group still active?" To date, we know of three (listed in The Whole PET Catalog):

1) The PET Program exchange, run by A.B. Computers.

2) Richvale Telecommunications in Toronto, ONT. Richvale offers tape copies of all TPUG diskettes;

3) ICUSS (Illinois Commodore Users Swap System), run by Robert Lemon and Frank Burzynski, for educational programs.

USER GROUPS BY LOCALITY:

MINNESOTA:

Mankato PUG, Mankato MN:

Mitzi Hamman, Computer Coordinator of St. Clair School in Mankato, MN writes that they are just starting a PET users' group. Her letter didn't include a return address, but you can reach her through Transonic Laboratories, also of Mankato, at 249 Norton St.

PUERTO RICO:

Ken Burch is trying to organize Commodore users in Puerto Rico by collecting a library of public domain programs. If you're in the area, contact J.K. Burch, Jr., at 1607 Calle Colon, Santurce, P.R. 00911

TEXAS:

RPCC (Rockwell Personal Computer Club), Richardson TX:

Rockwell International is a heavy purchaser of Commodore computers, with active groups at various factories around the U.S. PET owners in the Richardson, TX areas may contact the Rockwell Personal Computer Club via: Denise Gerneth, Software Librarian, RPCC, 3200 E. Renner Road CS7, m/s 462-250, Richardson TX 75080. The Richardson group has about 80 members, and is active with PET/CBM tutorial classes at each meeting, on the second Monday of each month.

NEW ZEALAND:

NZPUG, Port Nelson NEW ZEALAND:

New Zealanders now have a new PET User group. Convenor, secretary, office boy, librarian Gary Walker reports they have 16 members at present, and that the group grows with each issue of the semi-annual newsletter. Anyone interested is invited to contact: NZPUG, c/o Gary Walker, P.O. Box 5104, Port Nelson, NEW ZEALAND, or phone: NN85494 (evenings) and 81175 ext. 65 (days)

AND FOR YOU LONELY COMMODORE OWNERS...:

Have you ever wondered if there were Commodore owners nearby but unknown to you? Perhaps we can help. We have listed in zip code order most of the PET users who have contacted us through July, 1982. This list includes about 700 local areas in all, and a few of you are lucky enough to have more than one in your own postal code. If you are feeling lonely, you may send me a post card with your own name, address and other information on it to mail on to a lucky neighbor. Be sure to include U.S. postage for the postcard, and to enclose it in an envelope when you send it.-JS

VIC NOTES

INPUT# BUG:

Bob Baker reports there is a bug in the VIC when using the keyboard as a file to keep users from falling out of INPUT statements As has been said before, INPUT is more convenient, but not as bullet-proof as GET.-JS

DEBUGGING VIC PROGRAMS:

Having trouble with VIC programs, especially those that run only in the original 5K? Make friends with a PET owner. The extra memory and the resident monitor make a good place to look them over. You won't be able to run them there, but you can use TOOLKIT, MICROMON, etc., to work them over.-JK

WHY NO VIC "DOUBLES" GAMES YET?

"Why do none of the current VIC games play "doubles"? Some of the games on The SOURCE and COMPUSERVE can do this, by having up to eight people call in to the same game. Why is this, since the VIC can do so much more than the Atari or Intellivision video games, but can't seem to play "doubles" or have variations of games?"-CW

One answer is that the VIC only comes with one joystick port, although multiplexing could solve that.-JS

WANT ADS AND ANSWERS
(Product Needs)

WANTED: PET Risk

Jim Cychler of Ann Arbor, MI, a self-proclaimed "risk-nut" wants to buy PET Risk, reviewed in Midnite #7. Anyone know how to reach Pendulum Software?

WANTED: Trust Accounting System for a lawyer

James Fiorentini, of 3 Washington Square, Suite 303, Haverhill MA 01830, wants someone to write or adapt a TRUST ACCOUNTING package for the Commodore 8032/8050 system, to which he would eventually add a General Ledger system and time billing package. All this should hopefully interface with VISICALC and WORDCRAFT, and the "Safeguard one-write peg board system." We have a copy of his specifications. Have any of you users and programmers already attempted this, or want to try? If so, please contact James Fiorentini or the Strasmas (at the address inside the front cover)-ES

AVAILABLE: GEOTECHNICAL programs

Donald W. Tubbs, Consulting Geologist, has geotechnical programs for Commodore computers. His company is: GEO-LOGIC, P.O. Box 46608, Seattle WA 98146, (PH: 206/762-0313)

AVAILABLE: PET Graphic ROM for Epson MX-80 printers

As noted in The PAPER (v.4, no.3, p.8), John Nuttall has "programmed a character generator for the Epson MX-80 printer to enable it to do PET graphics. It is a single chip which replaces the old one and can be fitted in about three minutes. All the usual features are available plus TRS-80 block graphics. However, no cursor controls are printed and reverse field characters appear normal...A firm in England is offering this chip at a substantial discount. It is a pirated sample we sent and contains several bugs." For further details, send $2 to: Micro Electronics, 32 Orchard Av., Worthing, Sussex, ENGLAND.

CBM/PET/64 REVIEWS

BOOK REVIEWS

THE WHOLE PET CATALOG, edited by J.&E. Strasma with B. Beach. $10 from the editors, AB Computers, Richvale Telecommunications, Eatons, and others.

REVIEW #1: "I hope to be among the first to congratulate you fine folk on the excellent job you did in putting The Whole PET Catalog together. My fellow SNUG (Sabine Neches User Group) member, Mayland Harriman, bought a copy and brought it to me today for my review. There are no other words to say, except you just did a tremendous job and I hope it was a labor of love."-Conway (Slim) Wilson

REVIEW #2: "We have a copy of the Whole PET Catalog--what a massive job THAT must have been. Congratulations, and if it doesn't become a best-seller, I don't know what would!"-John Easton

REVIEW #3: Sue and Jerry Key called to say that it was an excellent book, nicely organized, and well worth the money. Sue liked the extra "white space" for making notes in the margins, while Jerry considered it wasted space. They were glad they didn't have to go through all 7 of the old Midnite's to find what they were looking for!-ES

(We'd suggest readers buy a copy now, as future Midnite/PAPER issues will refer back to it, there are no other back issues available, and 80% are already sold, with no plans for reprinting.-JS)

Update:

PROGRAMMING THE PET/CBM, by Ray West. $25 plus shipping from Compute! magazine or $35 from Level Limited (outside North America).

Since I never got the second British copy I requested, I ordered and received 2 copies from Compute! instead. In content, the two editions are virtually identical, except that the Compute! version has a one page addendum. However, there are three other differences: 1) The Compute! edition is cheaper, $28 overall. 2) It is also of cheaper construction, including: a) paper that is thicker and more yellow; b) it uses a glued binding instead of a sewn binding; and c) its printed text is larger, but its margins narrower. 3) It arrived in only one week, rather than two months (transatlantic).

These differences may seem trivial, but for one purpose they definitely are not: my wish for a hardbound edition. I've recently found a bookbinder willing to rebind West's book. However, the differences listed above make it easy to rebind the British edition and effectively impossible to rebind the Compute! one. Unfortunately, since West is no longer offering the British edition to North American readers himself, you'll have to order it from another British supplier if you want it hardbound.

Having decided to make the plunge, I've gone all the way, for a genuine red leather binding from Engel Bindery Co. (322 S.W. Blvd., Kansas City MO 64108). They estimate the work will take two months and cost $45. (Ordinary hardbinding would have been $25.) In sum: a British copy of the book costs about $35, the binding is $45, and during the 2 month wait, you'll need a $28 second Compute! copy, making for a total investment of $108. Obviously, it's an amazing book, to be worth the trouble. However, I still wouldn't recommend it to users with no previous computer experience, for the same reason I wouldn't use my Emergency Medical Technician textbook as a Scout first aid merit badge manual.-JS

BUSINESS REVIEWS:

Accounting Packages

FINANCIAL REPORT, $60 from Comm-Data Systems.

For a home or very small business, it would manage a simple check journal on any 16K+ PET with cassette or disk. Disk version has new quickloader startup by Strasma. Limited to 100 to 300 possible entries per file.

PLUSES: When one file filled, one would note its account balances and carry them over to newly created file. Error recovery and use of 40 column screen and keyboard input is pretty good. With Strasma's fast SUBSORT, it quickly reports data in order by check number, date, account name, or description and calculates ending balance(s). May select tight screen or more detailed printer output. WORDPRO instructions (12 pages) and sample data are adequate.

MINUSES: Screen display should allow an 80 column text mode which would be as attractively spread as the printout. Price is OK, considering SUBSORT is $35 alone. Menu-driven programming, better use of disk files, and other polish would make a better value. Recommended.-BA

Updates:

B.P.I. GENERAL ACCOUNTING, $395 from Commodore.

Requires 80 columns and 8050 disk drive. Excellent double-entry accounting package which by itself can handle general ledger and registers or journals for: payroll, accounts receivable and payable, cash receipts and disbursements, invoices, and purchased merchandise. For $395 each, add ACCOUNTS RECEIVABLE, ACCOUNTS PAYABLE, PAYROLL and other packages, which will do more detailed handling, such as check-writing and will post the data for use by GENERAL ACCOUNTING. [not tested.-ED]

Many NICE FEATURES: Handles more than one company or department. A queue can run a series of commands. Makes standard monthly entries. Accounts and customers, payors/payees, vendors, and employees are related by a system of prompts which appear on the screen ready for data entry. Outputs trial balance, profit and loss, or any of the above journal/registers. Disk files are cleared by end-of-month, -quarter, or -year functions. But the system won't let you do that until you post, print journals and statements, and backup data disk. Great manual/workbook lets you practice the package using sample set of books on demo diskette. Then it leads you through customizing the package for your own accounts and printer. Even with limited accounting experience, I wouldn't be afraid to use BPI to computerize a set of books. HIGHLY recommended.-BA

CMS ACCOUNTING PACKAGE, from CMS:

"B & C Office Supply...has sold many C.M.S. Accounting Packages. We think they are super. We can modify them to fit the customers' requirements. All our customers are very happy with it."-Dan Underwood

Promises, promises...

1) Cimmaron promised to send us a review copy of their new DENTAL ACCOUNTING SYSTEM, but hasn't.

2) Cyberia promised to send us review copies of their MARI medical accounting package and CYBER-FARMER agricultural accounting package, but hasn't. When and if they arrive, we will review them. Meanwhile, guest reviews about these programs are very welcome.-JS

Data Base Manager/Mail List Update:

JINSAM:

"I'm steamed every time I use JINSAM. For example, my address list is limited to 1200 records, but I can't get at the names because 'out of memory'. So I had to cut down #1 Prime key name to 3 letters. When I use additional fields, such as ZIP or state, again 'Try again--out of memory'."-Reinhold Aman

Word Processors

WORD PRO 5+, $450 from Professional Software.

"When I got WORDPRO 5+, I had to buy a triple-flip. The 96K memory is not one block, but 5 little blocks of memory. I could scream. Why didn't I buy SILICON OFFICE, which you endorsed in your MID.GAZ? Too late now."-Reinhold Aman

WORD PROCESSOR, $20, from William Robbins.

Versions for everyone! V5.06d for PET/CBM/64. These versions are well done and highly functional. Uses I/O well. Automatically indents first line of each paragraph, sends a spool file to disk, tape or disk load and save, good format controls for printing. Both versions tested functioned very well. With a little practice, this program provides an excellent alternative to the high priced word processors and is constantly being improved. Documentation a little weak, but not much needed, as menu provides most information. This is an excellent buy. Highly recommended.-JK

Other Related Programs

COPYCALC, $20, ($15 with any other program) from William Robbins.

Versions for all! V7.05 for PET/CBM/64. Matrix oriented super calculator. Excellent program for budgeting, estimating or any math oriented use. Program is well written but the VIC screen column limitations do not do it justice. Like Robbins WORD PROCESSOR, the documentation is a little weak, but not much needed. Takes some getting used to but with practice it serves its purpose well. Able to save or load files from disk or tape. Printout for more than six columns automatically repositions on paper so that all columns print in one pass (eat your heart out VISICALC!). Well worth the money. Highly recommended.-JK

SPELLMASTER, $195 from Management Systems Alternatives. Legal or Medical dictionary options $75 each.

Requires 80-columns and dual disk drive. 40 column PET/64 version is coming. Works on WORDPRO files. WORDCRAFT and SILICON OFFICE versions planned. Functional 4K ROM at $9000. Mostly self-documenting. Comes with a typical manual (utterly free of spelling errors!). Also has HELP screen and useful prompts.

Finally, a decent spelling program for the PET! It is far faster than MCI's WORDCHECK, and instead of a trivial 3000 word dictionary, SPELLMASTER's has 40,000+ words. Even better, it presents suspect words for editing in context, in reverse field, on a typical WORDPRO screen display. Those words may then easily be corrected or added to the dictionary for future reference (up to 3,000 more words on the 4040, and 20,000 more on the 8050.) Corrected files are resaved to disk, avoiding the hassle of reloading the word processor to search for errors. Can check up to ten linked files at once while you do other chores, and then, on request, show the suspect words in each file in turn. In my first use, an 8 page technical article took 4 minutes to check and found about 100 suspect words, of which only 2 were faulty. After adding often-used words to the dictionary, a second check listed far fewer suspect words. An option checks only 6500 words, plus user-added ones, saving a little scanning time, but creating a much longer list of unmatched words. In my review copy, it was easy to skip past a word when

editing; with a newly-available fix, you hit [home] to redo words on the current page. In summary, if you do word processing and don't spell well, you need SPELLMASTER. We now use it to check Midnite. Highly recommended.-JS

Update: VISICALC 8096 is a $20 upgrade from Visicorp, for owners of earlier VISICALC versions.-ES

EDUCATION REVIEWS:

EDUCATIONAL RESOURCES; Commodore Educational Marketing, $25 from Commodore.

Requires 8050 disk drive. HUGE (this thing has got to weigh ten pounds!) spiral bound notebook divided into six categories: Commodore Software; Hardware Information; Education Resources; Users Clubs and Users Groups; VIC Product Information; and Corporate Communications. Includes four 8050-format diskettes of educational programs from CEAB (Canadian Education Advisory Board). Designed for new Commodore users. Reads like an ad campaign: over half product announcements and magazine review reprints. Reprints pieces of the old CHANNEL DATA notebook. Veteran PET educators only need the new software house catalogs. As usual, some information is STILL incorrect, such our CIPUG address. The notebook l ooks thrown together, but may fill a need. Worth the price IF you need lots of programs and aren't near a user group. I'd wait for a later edition.-JO

LIBRARY CIRCULATION UTILITY, $60 from Comm-Data Systems.

On any 16K++ PET with cassette or disk, it would manage records of books checked out from a small library. Handles 100 to 300 possible entries per file. At some inconvenience, one might hand sort entries (by catalog no., due date, or student name) & post them to one of a group of files. Uses 40 column screen & keyboard input pretty well. Error recovery is OK. With Strasma's fast SUBSORT, it quickly reports data in order by checkout ticket number, date due, book's title or catalog no., or student's name or homeroom. May select tight screen or more detailed printer output. WORDPRO instructions (ca. 11 pages) and sample data are pretty good for understanding the package.

MINUSES: I had trouble loading the sample data file from disk. Limited capacity of a file. Screen display should allow an 80 column text mode which would be as attractively spread as the printout. Menu-driven programming and better use of disk files would make a better value. Recommended.-BA

GAME REVIEWS:

HIGH SEAS, $15 from Briley Software.

Semi-adventure-action game for 8K PETs. Goal is to rid the ocean of pirates and reclaim buried stolen gold. Hazards include pirate ships, digging on deserted islands, hurricanes, icebergs, coral reefs, and the Bermuda Triangle. You mustn't run out of food or water (stocked for 50 days) and keep your crew of 18 safe from mutiny. There's enough variables in the game to keep you active. Each game has a different scenario. Recommended.-JO

KOSMIC KAMIKAZE, from UMI. CASSETTE. Joystick optional.

Yet another spin-off of SPACE INVADERS. Very similar to Cursor's ALIEN. You fire missles at the bad guys as they descend upon your movable base. Uses fair color and jerky animation. Not worth the unknown price.-JO

HAM RADIO REVIEWS

SATELLITE TRACKER V1.2, $25 from Optimized Data Systems. Cassette.

Data calculator for orbiting amateur radio satellites. Printer optional. Written in BASIC. Apparently machine and ROM independent. Orbit Crossing Mode calculates the crossing time and longitude for each orbit subsequent to user supplied reference orbits. Output can be directed to the screen or printer. Track Plotting Mode calculates acquisition and loss of signal times and azimuth bearings, continuous azimuth and elevation headings and range to satellite. The subsatellite point is continuously plotted on the screen in reference to the user's location by using a map grid format. Data calculations are continuously updated on status lines above and below the grid. There is provision for real time tracking and calculation and display of a mutual contact window when the satellite is accessible to two separate stations.

As supplied the program lists three satellites: OSCAR 7, OSCAR 8, and the RS satellites are lumped together as one. Manual is quite good about identifying and locating variables used in the program so it can be customized for the user's location and updated with current orbital information for the listed satellites. Easily modified to list all the RS satellites individually or to include other preferred options.

I have used version 1.1 of this program for over two years and find it quite satisfactory after some minor modifications to allow defaulting on certain prompts. Overall, a very useful program with a pleasing display and relatively painless operation. I feel the price is a bit high, but probably justified because of the limited market.-Clark L. Stewart

WARNING: This diskette contains a special BAM-connected duplicate track, which checks on the absent of protect bytes, codenumbers etc. and writes direct into the memory of the disk-drive. Only home-made programs and illegal copies of business and commercial available programs may be duplicated on this special prepared diskette. Don't try to save a protected program, because it may result in destroying of this diskette or in big computer damage. Diskettes are fully warranted, but using them is for own risk and loss of information is usually guaranteed.

Commodore care

from PET Benelux Exchange

HARDWARE REVIEWS:

Computers

CBM 64, $595 from Commodore.

REVIEW #1: Uses VIC peripherals, but VIC disk needs 1 new ROM for the 64. Outwardly a light brown VIC, the 64 is far better overall, due to: 64K of memory instead of 5K; better sound and graphics; 40 column display supported by BASIC; plus better attachments. These include a very high quality built-in RF modulator for connecting the 64 to TVs, a monitor/hi-fi sound output, and a second game port. Unlike early VICs, the unit runs cool. The power supply is massive, and far from the keyboard. You can easily use the 64 on your lap.

As usual for new machines, software is mostly "coming", as is the IEEE-488 interface and the CP/m option. I enjoyed a variation of Cursor's RATRUN maze game, and the CBM 64 assembler. The best software thus far is the EMULATOR.

Only 3 gripes: 1) The cables coming out of the 64 could be combined into a curly cable. 2) Default colors at power up are a hard-to-read blue on blue. 3) The cassette must be kept over 2 feet from the TV.

On balance, I recommend '64' over VIC and PET now, not to mention Apple, Atari, Tandy, et. al., but not over 80 column CBMs. Major software houses are close to market with '64' versions of most well-known packages and games, not to mention new products like LOGO.-JS

REVIEW #2: Lots of niceties, such as the professional feel of its keyboard. I had to strain to read text on a TV. You can run a monitor and a TV at once. Most sound effects in the user's guide need improvements. The guide mentioned a coming programmer's reference guide. Mono hi-fi output. Best documented feature is the Sprites. I was very impressed with the sprite demo programs.

Allows you to enable RAM where there's ROM with a few POKE's. You may also 'soft-load' other languages. In one configuration (of 8) you have 64k RAM. CBM soft-loaded BASIC 4.0 should be available shortly. Using CP/M, you could run FORTRAN on your 64 using the Z80 softcard!!!!

What confused me most was loading from tape: the screen goes blank until the file has been found. The screen then comes back on, displays the filename, then stops. To continue loading, press any key. Overall, the 64 is a very powerful machine. Its graphics features can only be matched by Atari. The sound can't be matched by any other computer. I love its expandability. In my opinion, it's Commodore's best computer to date.-MN

Disk Drives Update

CBM 8050 DISK DRIVE, $1350-$1800 from Commodore.

Many nice packages require the one-megabyte 8050, but it's taken a lot of heat in Midnite pages. Using Strasma's guidance, I recently purchased one with Micropolis drives and -06 & -07 upgrade ROMs. I tested it by BACKUP of diskettes from Drive 0 to 1 and vice versa. Likewise, I did a COPY of more than 8 files from Drive 0 to 1 and vice versa. It works fine, except needing initializing once in a while. For 3 times the capacity of the 4040 Drive, one does pay the price of slightly slower file access and much slower BACKUP (8 minutes). For me, the added capacity and compatibility with nice packages and users having only an 8050 disk drive is worth it.-BA

Some Common Entry Points

compiled by Mark Niggemann

The following entry points for all Commodore ROM sets are the most called routines in machine language programs. Check for proper setup of registers, memory locations, etc., before calling these routines.

I would like to thank Jim Butterfield for his articles, which inspired me to compile these memory maps.

Common Entry Points, Original/Upgrade/4.0 Rom/VIC 20/CBM 64

Orig	Upgr	4.0	VIC	64	DESCRIPTION
C357	C355	B3CD	C435	A435	?OUT OF MEMORY
C359	C357	B3CF	C437	A437	Send Basic error message
C38B	C389	B3FF	C474	A474	Warm start, Basic
C3AC	C3AB	B41F	C49C	A49C	Crunch & insert line
C430	C439	B4AD	C52A	A52A	Fix chaining & READY
C433	C442	B4B6	C533	A533	Fix chaining
C48D	C495	B4FB	C579	A579	Crunch tokens
C522	C52C	B5A3	C613	A613	Find Basic line
C553	C55D	B5D4	C642	A642	Do NEW
C567	C572	B5E9	C659	A659	Reset Basic and do CLR
C56A	C575	B5EC	C65E	A65E	Do CLR
C59A	C5A7	B622	C68E	A68E	Reset Basic to start
C6B5	C6C4	B74A	C7AE	A7AE	Continue Basic execution
C863	C873	B8F6	C96B	A96B	Get fixed point number from Basic
C9CE	C9DE	BADB	CAD3	AAD3	Send RETURN, LF if in screen mode
C9D2	C9E2	BADF	CAD7	AAD7	Send RETURN, linefeed
CA27	CA1C	BB1D	CB1E	AB1E	Print string
CA2D	CA22	BB23	CB24	AB24	Print precomputed string
CA47	CA43	BB44	CB45	AB45	Print '?'
CA49	CA45	BB46	CB47	AB47	Print character
CE11	CDF8	BEF5	CEFD	AEFD	Check for comma
CE13	CDFA	BEF7	CEFF	AEFF	Check for specific character
CE1C	CE03	BF00	CF08	AF08	'SYNTAX ERROR'
CFD7	CFC9	C187	D0E7	B0E7	Find fl-pt variable, given name
D079	D069	C2B9	D185	B185	Bump variable address by 2
D0A7	D09A	C2EA	D1BF	B1BF	Float to fixed conversion
D278	D26D	C4BC	D391	B391	Fixed to float conversion
D679	D67B	C8D7	D7A1	B7A1	Get byte to X reg
D68D	D68F	C8EB	D7B5	B7B5	Evaluate string
D6C4	D6C6	C921	D7EB	B7EB	Get two parameters
D73C	D773	C99D	D867	B867	Add (from memory)
D8FD	D934	CB5E	DA28	BA28	Multiply by memory loaction
D9B4	D9EE	CC18	DAE2	BAD2	Multiply by ten
DA74	DAAE	CCD8	DBA2	BBA2	Unpack memory variable to FAC#1
DAA9	DAE3	CD0D	DBA2	BBA2	Copy FAC#1 to (X,Y) location
DB1B	DB55	CD7F	DC49	BC49	Completion of fixed to float conversion
DC9F	DCD9	CF83	DDCD	BDCD	Print fixed-pt value
DCA9	DCE3	CF8D	DDD7	BDD7	Print floating pt value
DCAF	DCE9	CF93	DDDD	BDDD	Convert number to ascii string
E3EA	E3D8	E202	E742	E716	Print a character
NA	E775	D722	NA	NA	Output byte as 2 hex digits
NA	E7A7	D754	NA	NA	Input 2 hex digits to .A
NA	E7B6	D763	NA	NA	Input 1 hex digit to .A
E7DE	F156	F185	F1E6	F12F	Print system message
F0B6	F0B6	F0D2	FFB4	FFB4	Send 'TALK' to bus
F0BA	F0BA	F0D5	FFB1	FFB1	Send 'LISTEN' to bus
F12C	F128	F143	FF93	FF93	Send 'LISTEN' Secondary Address
F12C	F128	F143	FF96	FF96	Send 'TALK' Secondary Address
F167	F16F	F19E	FFA8	FFA8	Send character to bus
F17A	F17F	F1B6	FFAB	FFAB	Send 'UNTALK' to bus
F17E	F183	F1B9	FFAE	FFAE	Send 'UNLISTEN' to bus
F187	F18C	F1C0	FFA5	FFA5	Input from bus
F2CD	F2AE	F2E2	FFC3	FFC3	Close logical file in .A
F32A	F301	F335	FFE1	FFE1	Check stop key
F33F	F315	F349	F1E2	F12B	Send message if direct
NA	F322	F356	FFD5	FFD5	Load subroutine
F3FF	F40A	F449	F647	F5AF	Print 'SEARCHING'
F411	F41D	F45C	F659	F5C1	Print file name
F43F	F447	F486	NA	NA	Get load/save type parms
F462	F466	F4A5	FFC9	FFC9	Open channel for output
F495	F494	F4D3	F867	F7EA	Find specific tape header block
F52A	F521	F560	FFC0	FFC0	Open logical file
F579	F56E	F5AD	F784	F701	?FILE NOT FOUND
F57B	F570	F5AF	F798	F715	Send error message
F5AE	F5A6	F5E5	F7AF	F72C	Find any tape block header
F667	F656	F695	F84D	F7D0	Set tape buffer start address
F67D	F66C	F6AB	F854	F7D7	Set cassette buffer pointers
F6E6	F6F0	F72F	FFCC	FFCC	Close channel
F78B	F770	F7AF	FFC6	FFC6	Set input device from LFN
F7DC	F7BC	F7DF	FFC9	FFC9	Set output device from LFN
F83B	F812	F857	F894	F817	PRESS PLAY..; wait
F85E	F835	F87A	F8AB	F82E	Sense tape switch
F87F	F855	F89A	F8C0	F841	Read tape to buffer
F88A	F85E	F8A3	F8C9	F849	Read tape
F8B9	F886	F8CB	F8E3	F864	Write tape from buffer
F8C1	F88E	F8D3	F8E8	F869	Write tape, leader length in .A
F913	F8E6	F92B	F94B	F8D0	Wait for I/O complete or stop key
FBDC	FB76	FBBB	FBD2	FB8E	Reset tape I/O pointer
FD1B	FC9B	FCE0	FCF6	FCB8	Set interupt vector
FFC6	FFC6	FFC6	FFC6	FFC6	Set input device
FFC9	FFC9	FFC9	FFC9	FFC9	Set output device
FFCC	FFCC	FFCC	FFCC	FFCC	Restore default I/O
FFCF	FFCF	FFCF	FFCF	FFCF	Input character
FFD2	FFD2	FFD2	FFD2	FFD2	Output character
FFD5	FFD5	FFD5	FFD5	FFD5	Load program to ram
FFD8	FFD8	FFD8	FFD8	FFD8	Save program from ram
FFE1	FFE1	FFE1	FFE1	FFE1	Check stop key
FFE4	FFE4	FFE4	FFE4	FFE4	Get character

Commodore 64 Memory Map

Though the Commodore 64 has been on the market a very short time, memory maps are already available. I haven't had time to fully check memory pages zero through three. Use VIC maps for those pages for now, since almost all major locations are unchanged. The exception is locations 0 and 1, which are registers of the 6510 I/O port.

I have included detailed maps of the 6566 video chip, the 6581 SID chip, the 6510 I/O port and the two 6526 I/O chips. The 6510 is code compatible with the 6502. The only difference is the 6510 has an I/O port plus DMA capability.

6510 I/O REGISTER

Hex	Decimal	
0000	0	Data Direction Reg.
0001	1	Output register
BIT 7		Game cart bit
BIT 6		Extension cart bit
BIT 5		Cassette motor
BIT 4		Cassette sense
BIT 3		Cassette write
BIT 2		Character input?
BIT 1		High Ram bit
BIT 0		Low Ram bit

Note: Some I/O lines on the 6510 are used in memory configuration. By setting or clearing these bits, it is possible for the 64 to have 8 different memory configurations.

MICROSOFT BASIC INTERPRETER

A000	ROM control vectors
A00C	Keyword vectors
A052	Function vectors
A080	Operator vectors
A09E	Keywords
A19E	Error messages
A328	Error msg vectors
A365	Misc messages
A38A	Scan stack for FOR/GOSUB
A3B8	Move memory
A3FB	Check stack depth
A408	Check memory space
A435	Print 'OUT OF MEMORY'
A437	Error handler routine
A469	Break entry
A474	'READY.'
A480	Ready for Basic
A49C	Handle new line
A533	Re-chain lines
A560	Receive input line
A579	Crunch tokens
A613	Find BASIC line
A642	Perform 'NEW'
A65E	Perform 'CLR'
A68E	Backup text pointer
A69C	Perform 'LIST'
A742	Perform 'FOR'
A7ED	Execute statement
A81D	Perform 'RESTORE'
A82C	Break
A82F	Perform 'STOP'
A831	Perform 'END'
A857	Perform 'CONT'
A871	Perform 'RUN'
A883	Perform 'GOSUB'
A8A0	Perform 'GOTO'
A8D2	Perform 'RETURN'
A8F8	Perform 'DATA'
A906	Scan for next statement
A928	Perform 'IF'
A93B	Perform 'REM'
A94B	Perform 'ON'
A96B	Get fixed point number
A9A5	Perform 'LET'
AA80	Perform 'PRINT#'
AA86	Perform 'CMD'
AAA0	Perform 'PRINT'
AB1E	Print msg from .Y & .A
AB3B	Print format char.
AB4D	Input routines
AB7B	Perform 'GET'
ABA5	Perform 'INPUT#'
ABBF	Perform 'INPUT'
ABF9	Promt & input
AC06	Perform 'READ'
ACFC	Input error msgs
AD1E	Perform 'NEXT'
AD78	Type-match check
AD9E	Evaluate expression
AEA8	Constant - PI
AEF1	Evaluate within brackets
AEF7	Check for ')'
AEFF	Check for comma
AF08	Syntax error
AF14	Check range
AF28	Search for variable
AFA7	Set up FN reference
AFE6	Perform 'OR'
AFE9	Perform 'AND'
B016	Compare
B081	Perform 'DIM'
B08B	Locate variable
B113	Check alphabetic
B11D	Create variable
B194	Array pointer subroutine
B1A5	Constant - 32768
B1B2	Float-fixed conversion
B1D1	Set up array
B245	Print 'BAD SUBSCRIPT'
B248	Print 'ILLEGAL QUANTITY'
B34C	Compute array size
B37D	Perform 'FRE'
B391	Fixed-float conversion
B39E	Perform 'POS'
B3A6	Check if direct
B3B3	Perform 'DEF'
B3E1	Check FN syntax
B3F4	Perform 'FN'
B465	Perform 'STR$'
B475	Calculate string vector
B487	Set up string
B4F4	Make room for string
B526	Garbage collection
B5BD	Check salvageability
B606	Collect string
B63D	Concatenate
B67A	Build string in memory
B6A3	Discard unwanted string
B6DB	Clean descriptor stack
B6EC	Perform 'CHR$'
B700	Perform 'LEFT$'
B72C	Perform 'RIGHT$'
B737	Perform 'MID$'
B761	Pull string parameters
B77C	Perform 'LEN'
B782	Exit string mode
B78B	Perform 'ASC'
B79B	Input byte parameter
B7AD	Perform 'VAL'
B7EB	Get parms for POKE/WAIT
B7F7	Convert to Integer in $14,$15
B80D	Perform 'PEEK'
B824	Perform 'POKE'
B82D	Perform 'WAIT'
B849	Add 0.5
B850	Subtract-from
B853	Perform 'SUBTRACT'
B86A	Perform 'ADD'
B947	Complement FAC#1
B97E	Print 'OVERFLOW'
B983	Multiply by zero byte
B9EA	Perform 'LOG'
BA2B	Perform 'MULTIPLY'
BA59	Multiply a bit
BA8C	Memory to FAC#2
BAB7	Adjust FAC#1/#2
BAD4	Underflow/overflow
BAE2	Multiply by 10
BAF9	+10 in floating pt
BAFE	Divide by 10
BB12	Perform 'DIVIDE'
BBA2	Memory to FAC#1
BBC7	FAC#1 to memory
BBFC	FAC#2 to FAC #1
BC0C	FAC#1 to FAC #2
BC1B	Round FAC#1
BC2B	Get sign
BC39	Perform 'SGN'
BC58	Perform 'ABS'
BC5B	Compare FAC#1 to mem
BC9B	Float-fixed
BCCC	Perform 'INT'
BCF3	String to FAC
BD7E	Get ascii digit
BDDD	Float to ascii
BF16	Decimal constants
BF3A	TI constants
BF71	Perform 'SQR'
BF7B	Perform 'POWER'
BFB4	Perform 'NEGATIVE'
BFED	Perform 'EXP'

6566 VIDEO DISPLAY CHIP

Hex	Decimal	
D000	53248	Sprite 0 X position
D001	53249	Sprite 0 Y position
D002	53250	Sprite 1 X position
D003	53251	Sprite 1 Y position
D004	53252	Sprite 2 X position
D005	53253	Sprite 2 Y position
D006	53254	Sprite 3 X position
D007	53255	Sprite 3 Y position
D008	53256	Sprite 4 X position
D009	53257	Sprite 4 Y position
D00A	53258	Sprite 5 X position
D00B	53259	Sprite 5 Y position
D00C	53260	Sprite 6 X position
D00D	53261	Sprite 6 Y position
D00E	53262	Sprite 7 X position
D00F	53263	Sprite 7 Y position
D010	53264	Sprite X MSB (can move sprite over full 320 320 pixel X axis)
BIT 0-7		Corresponds to sprites 0-7
D011	53265	Multipurpose
BIT 7		Raster compare
BIT 6		Extented color mode
BIT 5		Bit map mode
BIT 4		Unused
BIT 3		Row select (1=25 rows)
BIT 2-0		Scroll in Y direction
D012	53266	Raster read (R/O)
D013	53267	Light pen X latch (R/O)
D014	53268	Light pen Y latch (R/O)
D015	53269	Sprite enable (1=enabled)
BIT 0-7		Corresponds to sprites 0-7
D016	53270	Multipurpose
BIT 7-5		Unused
BIT 4		Multi-colour mode
BIT 3		Column select (1=40 columns)
BIT 2-0		Scroll in X direction
D017	53271	Sprite expand in Y dir. (1= 2x vertical size)
BIT 0-7		Corresponds to sprites 0-7
D018	53272	Multipurpose
BIT 7-4		Video matrix base
BIT 3-1		Character space base
BIT 0		Unused
D019	53273	IRQ Register
BIT 4-7		Unused
BIT 3		Light pen IRQ

BIT 2		Sprite-Sprite collision IRQ
BIT 1		Sprite-bkgrd. collision IRQ
BIT Ø		Raster scan IRQ
D01A	53274	IRQ mask reg. (Ø=no IRQ)
D01B	53275	Bkgr. to sprite priority
D01C	53276	Multi-colour sprite select
D01D	53277	Sprite expand in X dir. (1=2x horiz. size)
BIT Ø-7		Corresponds to sprites Ø-7
D01E	53278	Sprite-spr. collis. detect.
D01F	53279	Spr.-bkgr. collis. detect.
D020	53280	Border colour
D021	53281	Background colour Ø
D022	53282	Background colour 1
D023	53283	Background colour 2
D024	53284	Background colour 4
D025	53285	Sprite multi-colour Ø
D026	53286	Sprite multi-colour 1
D027	53287	Sprite Ø colour
D028	53288	Sprite 1 colour
D029	53289	Sprite 2 colour
D02A	53290	Sprite 3 colour
D02B	53291	Sprite 4 colour
D02C	53292	Sprite 5 colour
D02D	53293	Sprite 6 colour
D02E	53294	Sprite 7 colour

6581 SOUND SYNTHESIS CHIP

Hex Decimal

Voice 1

D400	54272	Frequency (LSB)
D401	54273	Frequency (MSB)
D402	54274	Pulse width (LSB)
D403	54275	
BIT 7-4		Unused
BIT 3-Ø		Pulse width (MSB)
D404	54276	Control Register Voice 1
BIT 7		Noise
BIT 6		Pulse
BIT 5		Sawtooth
BIT 4		Triangle
BIT 3		Test bit
BIT 2		Ring modulated
BIT 1		Sync
BIT Ø		Gate
D405	54277	Attack/decay Voice 1
D406	54278	Sustain/release Voice 1

Voice 2

D407	54279	Frequency (LSB)
D408	54280	Frequency (MSB)
D409	54281	Pulse width (LSB)
D40A	54282	
BIT 7-4		Unused
BIT 3-Ø		Pulse width (MSB)
D40B	54283	Control Register Voice 2
BIT 7		Noise
BIT 6		Pulse
BIT 5		Sawtooth
BIT 4		Triangle
BIT 3		Test Bit
BIT 2		Ring Modulated
BIT 1		Sync
BIT Ø		Gate
D40C	54284	Attack/decay Voice 2
D40D	54285	Sustain/release Voice 2

Voice 3

D40E	54286	Frequency (LSB)
D40F	54287	Frequency (MSB)
D410	54288	Pulse width (LSB)
D411	54289	
BIT 7-4		Unused
BIT 3-Ø		Pulse width (MSB)
D412	54290	Control Register Voice 3
BIT 7		Noise
BIT 6		Pulse
BIT 5		Sawtooth
BIT 4		Triangle
BIT 3		Test Bit
BIT 2		Ring Modulated
BIT 1		Sync
BIT Ø		Gate
D413	54291	Attack/decay Voice 3
D414	54292	Sustain/release Voice 3
D415	54293	Cutoff frequency (LSB)
D416	54294	Cutoff frequency (MSB)
D417	54295	Programmed filter
(Bits 7-4 select filter resonance: Ø=no resonance, 15=maximum)		
BIT 7-4		Resonance filter
(Bits 3-Ø if set, goes thru filter)		
BIT 3		External input
BIT 2		Voice 3
BIT 1		Voice 2
BIT Ø		Voice 1
D418	54296	Filter mode select
BIT 7		Off
BIT 6		High pass
BIT 5		Band pass
BIT 4		Low pass
(Bits 3-Ø is volume: Ø=min., 15=max.)		
BIT 3-Ø		Output Volume
D419	54297	A/D converter for Paddle X
D41A	54298	A/D converter for Paddle Y
D41B	54299	Oscillator 3
D41C	54300	Envelope 3

6526 CIA I/O CHIP #1

DCØØ	56320	Output data reg. A
BIT 7-Ø		Kybd column input
BIT 7		Paddle buttons 2&3
BIT 6		Paddle buttons Ø&1
BIT 4		Joystick button B
BIT 3-Ø		Joystick B control
DCØ1	56321	Output data reg. B
BIT 7-Ø		Kybd row output
BIT 4		Joystick button A
BIT 3-Ø		Joystick A control
DCØ2	56322	Data direction A
DCØ3	56323	Data direction B
DCØ4	56324	Timer A low
DCØ5	56325	Timer A high
DCØ6	56326	Timer B low
DCØ7	56327	Timer B high
DCØ8	56328	Tenths of sec.
DCØ9	56329	Seconds
DCØA	56330	Minutes
DCØB	56331	Hours
DCØC	56332	Serial data register
DCØD	56333	Interupt control reg.
BIT 4		Cassette read/SRQ
DCØE	56334	Control reg. A
DCØF	56335	Control reg. B

6526 CIA I/O CHIP #2

DDØØ	56576	Output data reg. A
BIT 7		Serial DATA in
BIT 6		Serial CLK in
BIT 5		Serial DATA out
BIT 4		Serial CLK out
BIT 3		Serial ATN out
BIT 2		RS232 output
BIT 1		6566 video addr 15
BIT Ø		6566 video addr 14
DDØ1	56577	Output data reg. B
BIT 7-Ø		User port/RS232
BIT 7	Data set ready	(DSR)
BIT 6	Clear to send	(CTS)
BIT 5	Unassigned??	(xxx)
BIT 4	Recieved line signal	(DCD)
BIT 3	Ring indicator	(RI)
BIT 2	Data terminal ready	(DTR)
BIT 1	Request to send	(RTS)
BIT Ø	Received Data	(Sin)
DDØ2	56578	Data direction A
DDØ3	56579	Date direction B
DDØ4	56580	Timer A low
DDØ5	56581	Timer A high
DDØ6	56582	Timer B low
DDØ7	56583	Timer B high
DDØ8	56584	Tenth of sec.
DDØ9	56585	Seconds
DDØA	56586	Minutes
DDØB	56587	Hours
DDØC	56588	Serial data reg.
DDØD	56589	Interupt control reg.
BIT 4		RS232 input
DDØE	56590	Control reg. A
DDØF	56591	Control reg. B

MICROSOFT BASIC CONTINUED

E043	Series evaluate 1
E059	Series evaluate 2
E097	Perform 'RND'
E0F9	Basic break pt from kernal
E12A	Perform 'SYS'
E156	Perform 'SAVE'
E165	Perform 'VERIFY'
E168	Perform 'LOAD'
E1BE	Perform 'OPEN'
E1C7	Perform 'CLOSE'
E1D4	Parms for load/save
E206	Check default parms
E20E	Check for comma
E219	Parms for open/close
E264	Perform 'COS'
E268	Perform 'SIN'
E2B4	Perform 'TAN'
E30E	Perform 'ATN'
E37B	Warm start
E394	CHRGET for zero page
E3BF	Initialize Basic
E447	Vectors for $300
E453	Initialize vectors
E460	Power-up messages

THE KERNAL

E500	Set i/o base in .X & .Y
E505	Set screen limits in .X & .Y
E50A	Track cursor location
E518	Initialize I/O
E531	Noralize screen

E544	Clear screen
E566	Home cursor
E56C	Set screen pointers
E5A0	Set I/O defaults
E5A8	Set video chip defaults
E5B4	Input from keyboard
E632	Input from screen
E684	Quote mark test
E691	Set up screen print
E6B6	Advance cursor
E6DE	Wrap up screen line
E6E9	Retreat cursor
E701	Back into preivious line
E716	Output to screen
E87C	Go to next line
E891	Do 'RETURN'
E8A1	Check line decrement
E8B3	Check line increment
E8CB	Set color code
E8DA	Color code table
E8EA	Scroll screen
E965	Open space on screen
E9C8	Move screen line
E9E0	Sync color transfer
E9F0	Set start of line
E9FF	Clear screen line
EA13	Print to screen
EA1C	Store to screen
EA24	Sync color to char
EA31	Interupt scan (IRQ)
EA87	Check keyboard
EB59	Set text mode
EB79	Keyboard vectors
EB81	Keyboard maps
EBC2	Shifted key matrix
EC03	Commodore key matrix
EC44	Graphics/text control
EC4F	Set graphics mode
EC78	Control key matrix
ECB9	Video chip defaults
ECF0	Screen line addrs low
ED09	Send 'TALK'
ED0C	Send 'LISTEN'
ED11	Send control char
ED40	Send to serial bus
EDB0	Timeout on serial
EDB9	Send LISTEN Secondary Addr
EDBE	Clear ATN
EDC7	Send TALK Secondary Addr
EDDD	Send serial deferred
EDEF	Send 'UNTALK'
EDFE	Send 'UNLISTEN'
EE13	Receive from serial bus
EE85	Clock line on
EE8E	Clock line off
EE97	Serial output '1'
EEA0	Serial output '0'
EEA9	Get serial input & clock
EEB3	Delay 1 ms
EEBB	RS232 send (NMI)
EF06	New RS232 byte send
EF2E	Error or quit
EF4A	Compute bit count
EF59	RS232 receive (NMI)
EF7E	Setup to receive
EFC5	Receive parity error
EFCA	Receive overrun error
EFCD	Receive break error
EFD0	Receive frame error
EFE1	File to RS232
F014	Send to RS232 buffer
F04D	Input from RS232 buffer
F086	Get from RS232 buffer
F0A4	Check serial bus idle
F0BD	Kernal control messages
F12B	Print if direct
F13E	Get byte from que
F14E	Get byte from RS232
F157	Input a byte
F199	Get from TAPE/SERIAL/RS232
F1CA	Output a byte
F1DD	Output to tape
F20E	Set input device
F250	Set output device
F291	Perform file close
F30F	Find file
F31F	Set file values
F32F	Abort files
F333	Restore default I/O
F34A	Perform file open
F3D5	Send Secondary address
F409	Open RS232
F49E	Perform load
F5AF	Print 'SEARCHING'
F5C1	Print file name
F5D2	Print 'LOADING' or 'VERIFYING'
F5DD	Perform SAVE
F68F	Print 'SAVING'
F69B	Update clock
F6DD	Read time into .A .X .Y
F6E4	Set time from .A .X .Y
F6ED	Test stop key
F6FB	Kernal error messages
F72C	Find any tape header
F76A	Write tape header
F7D0	Get buffer address
F7D7	Set buffer start, end pointers
F7EA	Find specific header
F80D	Bump tape pointer
F817	Print 'PRESS PLAY ON TAPE'
F82E	Check cassete switch
F838	Print 'PRESS PLAY & RECORD..'
F841	Initiate tape read
F864	Initiate tape write
F875	Common tape I/O
F8D0	Test I/O complete
F8E2	Adjust tape bit timing
F92C	Read tape bits (IRQ)
FA60	Store characters
FB8E	Reset tape read address
FB97	Reset counters for new byte
FBA6	Toggle tape
FBC8	Date write
FBCD	Tape write (IRQ)
FC57	Write tape leader (IRQ)
FC93	Restore vectors
FCB8	Set vectors
FCCA	Turn off tape motor
FCD1	Check read/write pointer
FCDB	Bump read/write pointer
FCE2	Power-on reset
FD02	Check cart rom slot
FD15	Setup kernal
FD50	Initialize system constants
FD6E	Test memory location
FD9B	Table of IRQ vectors
FDA3	Initialize I/O
FDF9	Save file name details
FE00	Save file details
FE07	Get status
FE18	Flag status
FE21	Set timeout for serial bus
FE25	Read/set top of memory
FE34	Read/set bottom of memory
FE43	NMI interupt entry
FE64	RESTORE/STOP warm start
FE72	NMI RS232 sequences
FEBC	Restore regs. & exit
FEC2	RS232 baud rate table
FED6	RS232 recieve bit (NMI)
FF1A	Lookup baud rate
FF43	Kybd scan entry during load
FF48	Main IRQ entry

JUMBO JUMP TABLE

FF8A	Restore vectors to defaults
FF8D	Change to user's vectors
FF90	Control kernal messages
FF93	Send LISTEN Sec. addr.
FF96	Send TALK Sec. addr.
FF99	Read/set top of memory
FF9C	Read/set bottom of memory
FF9F	Scan keyboard
FFA2	Set timeout for serial bus
FFA5	Handshake serial byte in
FFA8	Handshake serial byte out
FFAB	Send UNTALK to serial bus
FFAE	Send UNLISTEN to serial bus
FFB1	Send LISTEN to serial bus
FFB4	Send TALK to serial bus
FFB7	Read current I/O status
FFBA	Set LA, FA, SA
FFBD	Set filename addr & length
FFC0	Open logical file
FFC3	Close logical file
FFC6	Open channel in
FFC9	Open channel out
FFCC	Restore default I/O
FFCF	Input a byte
FFD2	Ouput a byte
FFD5	Load to RAM
FFD8	Save from RAM
FFDB	Set time clock
FFDE	Read time clock
FFE1	Check stop key
FFE4	Get byte
FFE7	Abort all files
FFEA	Update clock
FFED	Return screen size in X,Y
FFF0	Read/set cursor pos. in X,Y
FFF3	Return i/o pointer in X,Y

HARDWARE VECTORS

FFFA	Non-maskable interupt (NMI)
FFFC	System reset (RES)
FFFE	Interupt request break (IRQ+BRK)

Printers

OLYMPIA ES-100 DAISY PRINTER, $1450 for printer and Dataface GRQ-10 RS232 interface, plus $130 for TNW1000 IEEE to RS232 interface, from Kelley Business Machines and others.

Requires some commercially available, tested interfaces. The Olympia ES-100 is, for me, the answer to letter quality output for as little money as possible. It will NOT do listings very well, since one of the cursor controls causes the carriage to roll back and another causes a 10 second pause. However, for output with WORDPRO or another text processor, it is dynamite. My wife uses it as a typewriter, even when something else is running. I can go back and perform another function by just reaching over and doing it.

To work, plug in the TNW interface to PET, and install the Dataface inside the ES-100 at a 300 baud rate. Has print wheels in "script", "narrator" (large type face) and standard elite or pica. Assembled in Germany, printer seems built with real quality in mind. Overall, this is a super machine.-Ken Barroll

PRINTMASTER PRINTER, by C.Itoh; about $2000 from Leading Edge dealers.

55 cps. daisy-wheel printer. Faster Starwriter F-10. Has optional sheet feeder. Stencil option allows printing 6 instead of 3 copies at once. Also adds 2-color ribbon capability, and has room for a 2K print buffer on board by adding an $11 chip. RS232 version allows up to 9600 baud. Far lighter, quieter while printing, and lower than the older Starwriter 25. Includes a whisper fan, which is somewhat disturbing, but covers up the power supply noise that bothered me on the F10. Tractor feed, about $200 extra, is now bi-directional, and VERY well done. Also has a bottom feed slot, missing in the older Starwriter-25. Line-feed switch is quite rapid and convenient for inserting forms. Option switches are now accessible near front of unit. However, the cover no longer simply swings up, as on the 25; removing it takes a good tug, and an interlock won't allow use without it. Also, changing from Pica to Elite is now done with a little DIP switch rather than the large switch on the 25. Fortunately, it is easy to add toggle switches for often-used functions.

The printer is still very well made and looks good. Preliminary manual omits the switch settings, but Leading Edge provided these immediately over their toll-free line. It presumably includes all the F-10 features, which are too numerous to list. (A trivial example: it includes not 1 but 3 test modes, depending on which front panel switch is pushed at start-up.) The printer uses Qume control codes, and Diablo ribbons and print wheels, that makes it industry-standard. Has full year warrantee, with service centers around the country.

It would be hard to find a better daisy-wheel printer today at any price. It is selling like hotcakes. The only reason to get a lesser printer for word processing is to save money. Highly recommended for all commercial uses.-JS

MX-80/MX-70 FRICTION FEED KIT, $65 from Orange Micro.

Conversion friction feed kit containing a rubber platen with little rollers that hold the paper straight plus tractor feed sprocket wheels at either end of the platen. Installation takes less than 45 minutes. You can switch back to straight tractor feed in about ten minutes. The kit does not change the printer top's contour. The cover fits as well as ever and the top is almost flat.

Friction feed works fine, but would never do for a long roll. Tractor feed does not work as well as Epson's. Original tractor mechanism engages three sprocket teeth on each edge, which work against a guide holding paper about 90 degrees around the sprocket wheel. When the rubber platen is in place, tractor feed only makes half the contact, with no guides holding paper against the wheels. If the paper is pulled or pushed hard out of the printer, the sprocket holes may rip or throw the paper out of alignment. I left mine in the original tractor-feed mode. If you want friction feed, it's a good product.-JF

Interfaces

PROCTOR, $95 from Skyles Electric Works.

The PROCTOR daisy-chains a number of PET/CBM's (BASIC 2 or 4) to 1 IEEE bus and avoids interfering with each other while accessing IEEE devices. One PC board per computer. Uses three wire connector. You provide IEEE cables. Program at top of memory gives the user an abbreviated disk command set, eliminating SCRATCH and NEW commands. To install, attach a PC board to the parallel user and first cassette port; then connect the PETs via a three wire cable.

Doesn't automatically control IEEE bus. To avoid crashes, all must SYS first. Screen freezes until line is free when using the PROCTOR commands or SYS. This is confusing. Students using BASIC 4 could also SCRATCH a disk.

Relatively inexpensive. Understandable manual with good "test problem-solving" approach. Simple to use and does what it advertises. It's a good solution for a school on a tight budget. Especially recommended for computer assisted instruction, rather than teaching BASIC.-JO

TNW232D, $370 from TNW.

Two channel bi-directional serial to IEEE-488 interface. Cables optional, $25 or $35. Refined product, typical of TNW, packaged in large (9x14x2") attractive case. Circuit board clearly identified and well made. Full manual, including schematic and parts layout. Power supply inside case, with true RS232 voltages. Detachable power cord matches current CBM products. Circuit is mostly small chips, with most control via 5 sets of DIP switches. I prefer this to software setup. Two channels are set independently. Has channel for program control of RS232 control lines and allows transmission of RS232 BREAK characters.

NEGATIVES: Uses four IEEE-488 addresses, with a base address that is a multiple of 4, that address +1 for control, and that address +2 for the second channel. This creates a problem for my use--driving an ASCII printer plus RS232 modem. Most terminal programs call the modem device 5, like the CBM 8010; this requires a slight hardware change on the 232D. Does not use the SRQ line of the IEEE-488 bus. Neither does CBM BASIC, but the CBM 8010 modem and some IEEE terminal packages do. TNW hopes to alter Punter's "terminal" program for their interface and modem. To set DIP switches or to change power fuse, you must remove the cover with a screwdriver. Has code correction between PET and true ASCII for Old ROM PETs only. Most major program packages now allow for ASCII printers. Though I have it, I rarely use code correction.

POSITIVES: One of its best features is its plugs. Instead of dangling behind the PET, only a small edge connector attaches to PET. The main connections are at the interface itself, which includes a spare IEEE port for other devices. Most amazing is that it worked perfectly right out of the box; the default switch settings are correct for my printer and modem. Another nice surprise was that the RS232 cable includes both male and female DB25 connectors. If you only need one RS232 channel, consider the cheaper TNW2000 interface (well-reviewed previously), but if you need two channels and can spare 4 IEEE addresses, this is the best interface we've seen. Recommended.-JS

Updates:

CMC INTERFACES:

CMC interfaces have an ingenious connector that hooks in line with an IEEE-488 edge connector, saving the cost of a cable. However, the connector has a tendency to loosen after a year or so. A preventive measure is to avoid plugging and unplugging the interface. Another is to keep the connector level, by propping it up. A cure, which also helps the PIE-C, is to add a P-I cable so the connection to PET is indirect.-JS

PIE-C INTERFACE:

In the Whole PET Catalog, we mentioned that thus far no one had suffered any damage from the excess height of the PIE-C interface from Lemdata Products. Gene Beals of A.B. Computers has since informed us that he personally has broken a connector off a PIE-C board by accidentally opening his PET with the interface installed, and knows of 3 others who have done likewise. Fortunately, the PIE-C breaks before the PET motherboard! Current PIE-C boards include a hook to keep the interface board from flexing the motherboard, but apparently that doesn't help if the computer case is opened with the board in place.-JS

Upgrades

80-COLUMN CONVERSION BOARD, $250 plus $75 installation from Execom.

REVIEW #1: For CBM and PET models with 9" screens, and BASIC 2 or 4. When introduced, this board was incompatible with memory-mapped video . But a recent-revision works well with everything; only programs that alter IRQ fail. I am very pleased with it. Installation costs $75 extra, but is worth it. Doing my own took 12 hours. Board changes are hidden under a 4X6" add-on video board. A $25 option reverses the character generator, giving black type on a green screen. Without it, characters are either faint or fuzzy, depending on brightness. For another $25, Execom provides a board to switch between normal and reverse video ROMs. Highly recommended.-JS

REVIEW #2: When you decide that your old 9" screen 16/32K PET has limited use after trying all the games and cheaper word processing programs, but you can't afford $1500 to get the 80-column screen that you need to do serious processing, this product literally gives you a new machine. For my purposes (to run WORDPRO 4+), I upgraded to 4.0, and added 80 columns ($325), a 9 character buffer screen editor ($25), and a reverse character generator ($15).

BAD POINTS: The 40-column programs must be converted to 80 columns. The program CONVERT 80 to 40 won't work, because your machine lacks the 6545 chip.

GOOD POINTS: The 80-column business programs can now run on your machine. I feel that, next to games, word processing is the best use of a computer. With the 9 character buffer option, WORDPRO runs the same. Highly recommended.-JO

RB-4 BOARD, $50 (or $70 for RB-4) from Better Solutions.

Upgrades old PETs to BASIC 4 ROMs. RB-4a includes an IC clip to eliminate soldering to 5 pins on PET board IC). Versions for Old PETs with 24- or 28-pin ROMs. You must remove PET's circuit board, cut 2 places, and solder 2-7 locations. Illustrated documentation is pretty complete. Bob Mergy gives good aid over the phone and is improving documentation. When the board is installed, you install separately obtained 4.0 ROMs (or EPROM copies). I've made a 2K $e000 EPROM containing two alterations: 1) a lookup table for graphic keyboards, and 2) a patch to slow screen scrolling and prevent aggravating screen flicker. I've also made a character generator EPROM, which gives upper case with shift and lower-case without. (Write me for details.) HIGHLY recommended if you have experience tinkering with circuit boards.-BA

MAGAZINE REVIEWS

JEFFRIES REPORT, $15 for 6 issues, from the Code Works.

6 page monthly newsletter. Finally, a Cursor Notes with full-size printing. It's good to read Ron Jeffries' comments again. The first issue of his magazine does include both good new information about Commodore's planned 16+ bit microprocessor, and details beyond press releases on the workings of chips in the "64". The Report is well written, well printed, interesting, outspoken, and quite possibly worth its considerable cost.-JS

STRICTLY COMMODORE, $18 for 6 bi-monthly issues, (twice listed as $2/issue), from Strictly Commodore, Inc.

Add $10 to join a planned program exchange. 36 page Canadian newsletter, the size and format of Midnite 1-7. It is "software-oriented" and "devoted to VIC-20, PET, CBM, and SuperPET". Contents include 3 pages of software and hardware they hope to sell by mail, 2 pages of hints, 4 tiny game listings with instructions, 4 reviews, 10 press releases, an ad for another magazine they plan to sell, and several pages about why you should subscribe.

We all have to start somewhere.... As a PUG newsletter, Strictly Commodore would be fine. As a competitor to magazines with similar prices, such as the Transactor, the TorPET, The Paper or current Midnites, let alone Micro or Compute!, it's hopelessly outclassed. Why? For instance, 1) in calling MICROCHESS 2.0 "one of the best chess programs available for PET computers", the reviewer shows ignorance of SARGON II and PETCHESS, gives the wrong company name, omits the price, omits the reviewer's name, and neglects to mention which BASICs and screens can use it; 2) the tiny listings are barely readable, and not as good as user group equivalents; and 3) the "Crash-Proof Inputs" hint crashes machines with Upgrade BASIC 2.

The cover is a blatant copy of Compute!'s Commodore logo. As they say, "information from most major publications." Though it hurts to say this about a Commodore resource, NOT recommended.-JS

MODEM REVIEWS

TNW103, $389 from TNW Corporation, plus $159 for DAA to phone line.

Direct connect 300 baud MODEM, with auto-answer auto-dial. Includes PTERM 103 terminal program. Arrived too late for review, but does exist and work.-JS

PET TERMINAL EMULATOR, from Amplify, Inc.

"It takes about five minutes to install, and has performed flawlessly during the nine months I've been using it. It lets you choose from 3 popular terminals. Best of all, it permits you to keep a program in RAM while you are operating in terminal mode, and to switch back and forth from terminal mode to stand-alone operation with a single command. This makes possible all sorts of nifty maneuvers, like entering screen output from the terminal mode into the PET's memory. Highly recommended!"-William H. Panning

UTILITY REVIEWS:

SCREEN PRO, $40 from KCCI. For 8032, CBM disk and printer.

Allows you to compose a screen. Adds a few more commands, and makes cursor vanish when you are done. Whole screen is then quickly saved as a sequential file on disk. The program is careful about file names, backup copies and so on. Has fast screen-disk interchange. Can also send the screen to a printer. Comes with two CBM printer versions (CBM 2022 and 4022). If you have an ASCII printer, you will have to change the machine language. An average manual tells you where each routine is located and generally how things work.

Includes 2 demo programs. The first is a linked series of files providing a good, efficient way to store and display long lists. Pick the series you want from a menu; the first full screen appears in a second or so, followed by the next, and so on. Hold down a key to stop. You can edit, but cannot sort or search. A series of screens could simulate movement. It takes a second or two to flip, but there is no blank interval. The second demo has screen-files linked in a tree structure, with unlimited branches at each level. The only limitation on screens is disk size--well over 200 on the 8050.

This is not a toy or game; it is the basis of a complete system of information storage. The casual programmer may find this system requires much attention to details (as do ALL good computer-based systems). Author Keith Peterson urges the user to incorporate the system into programs for special needs. If you write a lot of text, this is a neat and efficient way to program. I recommend this system to PET/CBM users who write serious programs needing lots of text or graphic displays.-JF

SORT, $55 from Matrix Software.

REVIEW #1: 2K EPROM used at $9000. Not for BASIC 1. Machine language sort and screen dump chip. "I've used this $55 chip from Matrix for a couple of months now and I am very pleased. It solved two of my program problems. A fast screen print and a fast sort. I have never yet had a sort fail on me. I've enclosed the documentation that they send with the chip. It's not much but its all that really needed. I would recommend it to anyone who wants a ML sort and screen-dump in ROM."-Dan Underwood

REVIEW #2: According to an underlined section in the Dan's instructions, the screen print ignores PET graphics but works with both 40 and 80 column screens. SORT is a reputable competitor to my own SUBSORT, sold by A.B. Computers and others. Dan neglected to mention that SORT is the only such product to conveniently sort real number arrays.-JS

SUBSORT Update:

Jim has updated his SUBSORT to use machine-language instead of BASIC to relocate itself in high memory for all CBM/PET BASICs. This makes loading his sort much faster. Owners may update, for our standard disk copying fee of $15.-ES

VIC REVIEWS

NEW VIC OFFERINGS FROM HES:

Just after our editorial deadline for this issue, we received a large collection of VIC programs from Human Engineered Software. We have reviewed them elsewhere in this issue with the help of a quickly-assembled committee of brand-new VIC owners. The list of programs reviewed includes five cartridges, each able to work with both stripped and expanded VICs. The new offerings also include 7 cassette games, each of which works on a stripped VIC, chains through instructions first and then the game, requires a joystick, and allows the user to center the screen image. HES Programs have almost always received favorable reviews, not only in these pages, but in every magazine that has tested their wares. They have a reputation for excellent programs and documentation.-JS

VIC ASSEMBLER REVIEWS

THE ASSEMBLER, $25 cassette from French Silk.

REVIEW #1: An assembler, editor, and loader package written in BASIC. SLOW!!! Documentation was thorough. Can be used in stock VIC. Editor finds errors before you assemble. The coding is very similar to the old Personal Software assembler. I assembled a file I saved with the PS assembler and it worked!! Looks like an improved version of the PS assembler, for the VIC. Recommended for those who are inexperienced in 6502 assembly language.-MN

REVIEW #2: We were sent a review copy of this program too late to make this issue. The documentation, which seems to be fairly good, shows it to have a lot of power within the limitation of BASIC. HESBAL is its closest competitor at the moment, with apparently fewer features.-ES

Eastern House Software apparently now has ASM/TED for the VIC. If so, VIC users can now take part in ATUG (ASM/TED Users Group). Commodore has also adapted its official assembler to work on the 64. We have heard it is now being circulated by dealer reps, and we hope to be able to review it next time.-JS

VIC BOOK REVIEWS

UNDERSTANDING YOUR VIC, $14 from TIS.

Another TIS manual to learn BASIC programming on the VIC. Author expects user to know high school math and a little BASIC. Slow, but not insulting, step-by-step approach. Tells you what to type, what will happen and what will appear. Works its way through BASIC, mentioning special VIC characteristics. Last 3 sections are particularly well done. First section handles program design in an interesting way, by reinforcing good programming suggestions given at the beginning of the book. Author uses pseudo-code (a structured English) to describe what must be done in a program. He then shows how to convert that to BASIC. This design is continued through next two sections on color and sound. Appendices list programs in full, and describe some mathematical and logical functions.

Some advanced VIC capabilities were left out, especially definable characters. All in all, a good beginner's manual, but those who know how to program a PET won't learn much. Teachers may want a copy just for the way program design is presented! Does a much more complete job than Commodore's.-RB

VIC BUSINESS REVIEWS:

Word Processors

HES WRITER, by Jerry Bailey. $40 cartridge from HES. RAM expansion optional, but the instructions don't tell how to use them.

REVIEW #1: For disk or tape and VIC 1515 or IEEE printers. Should be quite adequate for correspondence.-JS

REVIEW #2: Instructions not very clear, but can be understood with a little effort. Holds 121 lines of text. Has good formatting capabilities. Can provide line numbers if you wish. Automatically numbers pages, centers, right justifies and breaks pages. Has full cursor control in edit mode. Much superior to VIC TYPEWRITER because of its formatting controls, with one exception: the VIC TYPEWRITER explains how to use RAM expanders for greater text capacity.-LW

VIC TYPEWRITER, $17 cassette from Commodore. Easy to use with RAM expanders up to 32K. However, it holds fewer lines of text than HES WRITER and has NO formatting controls. I definitely prefer HES WRITER.-LW

WORD PROCESSOR, $20 cassette from William Robbins. Version V5.09sd for VIC. See review in CBM/PET/64 review section.

Other Related Programs

COPYCALC, $20 cassette ($15 with 2nd program) from William Robbins. Version V6.28 for VIC. See review in CBM/PET/64 review section.

VIC EDUCATION REVIEWS

MATH BALANCE, $7 cassette from Athena Software.

Educational drill program for balancing equations. It couldn't keep a grade school student's interest for more than 5 minutes. The documentation doesn't tell how to change the difficulty of those problems. Very dull.-MN

TURTLE GRAPHICS, by David Malmberg, $40 cartridge from HES. RAM expander optional.

REVIEW #1: Very good cartridge to start out with if you are learning BASIC, because the commands are letters instead of whole words. Nice manual takes you through everything needed to get started. Has catalog of commands.-CW

REVIEW #2: Good for elementary children who know how to spell. However, 6 year old Jamie Strasma wasn't interested when I offered to let him run it.-AL

REVIEW #3: An "easy to learn" graphics language along the lines of LOGO.-JS

VIC GAME REVIEWS

AGGRESSOR, cartridge from HES. Requires joystick.

REVIEW #1: Like DEFENDER. Good color graphics, with constantly changing background (nice figures). Has different levels, but I couldn't figure out how to set them. Took awhile to learn, then easy to play. Fun, but not challenging.-AL

REVIEW #2: Goal is to keep space thieves away from loot while avoiding their fire, somewhat along the lines of Cosmic Jailbreak or Defender.-JS

DAM BOMBER, by Gunter Koch. $16 cassette from HES. Adapted from Jim Butterfield's game of the same name. Requires joystick.

VIC version has much better graphics than the 8032 version (not just because of the added color!). Adds vertical movement to the bomber. Great sound.-AL

MAZE OF MIKOR, by Gunter Koch. $18 cassette from HES. Joystick required.

REVIEW #1: MAZE has 3 levels. Good graphics and sound. Instructions are good, but quite lengthy and take a long time to view. Hard to tell which direction rifle is pointing. Fairly easy to play for any age group.-LW

REVIEW #2: It has a lot of instructions which are difficult to understand. Otherwise, it has very good graphics and I enjoyed the game.-CW

MILLIPEDE, $15 cassette from On-Line Software.

REVIEW #1: BASIC and machine language. Needs standard 5K. Joystick optional. You must blast the millipede before it reaches the bottom of the screen and hits you. Uses the same characters as the PET version (such as diamonds, clubs and large dots) but with added color. Fair to good sound effects and excellent speed of play. I feel the only draw back of the game is in the graphics; if they had used HI-RES, I would have rated the game excellent. MILLIPEDE can provide hectic and exciting play for the younger gamers and even the people not so young. Recommended-JO

REVIEW #2: "I HIGHLY recommend that you get it. This is a fantastic program!!! Obviously based on Atari CENTIPEDE, with mushrooms, spiders, scorpions, poison mushrooms. Works only with old or upgrade ROMs, 40 columns, on cassette. 52 levels of play. I have barely gotten past level 12!!"-Jeff Porter

RENAISSANCE, $50 cartridge from UMI.

An excellent game of Othello! Uses both joystick and keyboard. Eight levels of play. Excellent use of color - it's easy on the eyes even after a few hours of playing). Screen displays all eight play options: PL (play), CH (change side, useful when losing a game), TA (take back), SE (set the board), HE (help, works only at levels 2-8 and gives you only a suggestion of a good move), LE (level, to choose a level of play), SA (save to tape, an excellent idea, especially on higher levels), LO (load from tape, a necessity from the previous command). Allows only legal moves when playing.

Rates very high as sophisticated computer board game. When we ran RENAISSANCE on the VIC next to the previous PET champion, MICROTHELLO (by Michael Riley), on the 32K PET, RENAISSANCE barely lost at level 1 on both. Haven't tested other levels yet, but RENAISSANCE always beats me at level 3. Price is steep, but is best Othello program for VIC so far, for play and programming quality.-JO

(NOTE: A good book on Othello is How To Win At Othello, by Goro Hasegawa with Maxine Brady, published by Jove.)

SKIER, by Gunter Koch. $18 cassette from HES. Joystick required.
This game is the most fun one I've played so far! Very good graphics; a cute little ambulance comes out when skier hits a tree! I highly recommend it. 3 different skill levels. Cassette instructions made it very easy to play. I wouldn't get tired of it, because it has so many different random movements.-CW

SNAKMAN Update:
Is the best and most fun to play of any home computer game so far, but still doesn't seem quite as real as the arcade game.-CW

TANK TRAP, by Gunter Koch. $18 cassette from HES. Joystick required.
[Amie and Chris had a hard time figuring out how to play this one.-ES] They could have done better on the graphics and added some more exciting sounds. Really needs written instructions to understand the object of the game!-AL

TANK WARS, by Gunter Koch. $18 cassette from HES. Joystick required.
Good graphics and sound. Terrible game, because enemy tank often moves as a mirror image of your tank, making enemy tank really tough to hit. If enemy tank moved in a more random fashion, it could be fairly decent.-LW

PAC BOMBER, by John O'Hare. $16 cassette from HES. Joystick optional.
Wasn't too exciting. Rather simplistic. All you do is move this guy back and forth to catch falling bombs. Recommended for elementary kids only.-AL

VICTREK & VICTREK 8K, by Gunter Koch. $18 cassette from HES. Joystick required. 8K version, (untested), requires added memory.
Kiddie Startrek. Should I complain because the 3K Startrek lacks such standard options as phasors and shields, or rejoice that there even IS a Trek for the bare-bones VIC? Easier to master than standard Treks, but I vastly prefer my 24K version.-JS

VIC MONITOR REVIEWS

HESMON, by Jerry Bailey. $40 cartridge from HES.
Adapted from Bill Seiler's "Micromon" as enhanced by Arthur Cochrane, et al. Everything you could want in an extended monitor for VIC - more, in fact, than the PET versions. But somehow it isn't as usable as Commodore's similar VICMON. The main problem is the narrow VIC screen, but VICMON has a more pleasing and usable display, even though it only does about half as much.-JS

RESOURCES

Here are the addresses for products mentioned in this issue:

A.B. COMPUTERS	252 Bethlehem Pike, Colmar PA 18915
AID	5901 John Martin Drive, Minneapolis MN 55430
AMPLIFY, INC.	2325 McBride, Iowa City IA 52240
ASSOCIATED MARKETING SYSTEMS, INC.	55 Central Dr., Farmingdale NY 11735
ATHENA SOFTWARE	727 Swarthmore Dr., Newark DE 19711
BETTER SOLUTIONS	P.O. Box 581, Santa Teresa NM 88008
BRILEY SOFTWARE	P.O. Box 2913, Livermore CA 94550
CANADIAN MICRO DIST.(CMD)	500 Steeles Av., Milton ONT L9T 3P7 CANADA
CIMARRON CORPORATION	666 Bakert St.-Suite 319, Costa Mesa CA 92626
CONNECTICUT MICROCOMPUTERS (CMC)	34 Del Mar Dr., Brookfield CT 06804
CMS SOFTWARE SYSTEMS (Charles M. Stuart)	5115 Menefee Drive, Dallas TX 75277
CODE WORKS	P.O. Box 550, Goleta CA 93116
COMAL USERS GROUP & COMAL CATALYST	5501 Groveland Terrace, Madison WI 53716
COMM-DATA SYSTEMS	Box 325, Milford MI 48042
COMMODORE U.S.	The Meadows, 487 Devon Park Rd., Devon PA 19087
COMPUSERVE	5000 Arlington Centre Blvd., Po box 20212, Columbis OH 43220
COMPUTE!	P.O. Box 5406, Greensboro NC 27403
COMQUEST	221 E. Camelback, Suite 1 Phoenix, AZ 85012
CONNECTICUT MICRO COMPUTERS	34 Del Mar Dr., Brookfield CT 06804
CYBERIA, INC.	2330 Lincoln Way, Ames IA 50010
DATAFACE INC.	2372 Walsh Ave., Santa Clara, CA 95050
ECLECTIC SYSTEMS CORP	Box 1166, 16260 Midway Rd., Addison TX 75001
EXECOM	1901 Polaris Av., Racine WI 53404
FRENCH SILK	P.O. Box 207, Cannon Falls MN 55009
HUH ELECTRONICS	1429 Maple St., San Mateo CA 94402
HUMAN ENGINEERED SOFTWARE (HES)	71 Park Lane, Brisbane CA 90066
ICUSS NEWSLETTER	c/o Robert Lemon, 326 Joliet St., West Chicago IL 60185
JINI MICRO SYSTEMS	P.O. Box 274, Riverdale NY 10463
KANSAS CITY COMPUTERS (KCCI)	5214 Blue Ridge Blvd., Kansas City MO 64133
KELLEY BUSINESS MACHINES INC.	1820 Terry Ave., Seattle WA 98101
LEADING EDGE COMPUTER PRODUCTS	225 Turnpike St., Canton MA 02021
LEMDATA PRODUCTS	P.O. Box 1080, Columbia MD 21044
LEVEL LIMITED	P.O. Box 438, Hampstead, London NW3 1BH, UK
MANAGEMENT SYSTEMS ALTERNATIVES	6219 - 13th Av., St. Petersburg FL 33707
MATRIX SOFTWARE	315 Marion Av., Big Rapids MI 49307
ON LINE SOFTWARE	Box 2044, Orcutt CA 93455
OPTIMIZED DATA SYSTEMS	P.O. Box 595, Placentia CA 92670
ORANGE MICRO	3150 E. LaPalma, Suite G, Anaheim CA 92806
OSBORNE/MCGRAW-HILL	630 Bancroft Way, Berkeley CA 94710
PROFESSIONAL SOFTWARE	51 Fremont St., Needham MA 02194
RECREATIONAL SOFTWARE SERVICES	38 Franklin St., Northampton MA 01060
RICHVALE TELECOMMUNICATIONS	10610 Bayview, Richmond Hill ONT L4C 3N8 CANADA
WILLIAM ROBBINS	P.O. Box 3745, San Rafael CA 94912
SKYLES ELECTRIC WORKS	231 E S. Whisman Rd., Mountain View CA 94041
STRICTLY COMMODORE	49 Coachwood Pl. N.W., Calgary ALB T3H 1E1 CANADA
TOTAL INFORMATION SERVICES (TIS)	P.O. Box 921, Los Alamos NM 87544
TNW CORPORATION	3351 Hancock St., San Diego CA 92110
TORPET	c/o Bruce Beach, Horning Mills ONT L0N 1J0 CANADA
UNITED MICROWARE INDUSTRIES (UMI)	3431-H Pomona Blvd., Pomona CA 91768
VISICORP	2895 Zanker Rd., San Jose CA 95134

ARTICLES

Keep the Spirit

by Ralph Bressler

Those of you who have been regular subscribers to The PAPER or who have picked up an occasional issue will recognize me as the publisher of that late newsletter. Late describes The PAPER in at least two ways. Over the past two years Doug Haluza, the editor, and I have tried to issue The PAPER on some kind of regular basis. We often fell short of our goal. Now The PAPER has combined with the Midnite Software Gazette to bring the readers of both publications the best in reviews, commentary, articles, rumors and answers to their questions. With all of us now working on each issue, I feel sure the readers will get the best information available on time.

I, like many of you, am a veteran Commodore user who had one of the original PETs when they first burst on the scene. I remember some of the first programs I typed in from magazines or created myself. After they were debugged, I traded them with friends to increase my library and show others what I could do. I also remember meeting with other users and discussing the newest bits of information we had gleaned from our machines. These activities became somewhat formalized in program exchanges and newsletters. The program exchanges have flourished, but most of the newsletters have died out. I am really at a loss to explain this phenomenon. Perhaps it is because programmers feel confident writing programs, but get cold feet when they start to write about their programs. Recently, several authors asked if I could pay them for articles, and I am sure those that run program exchanges get similar requests. These are not unreasonable or outrageous questions. When you stand on the outside and look in, it must seem like $20 per subscription or $10 per disk is enough to make a healthy profit. Let me assure anyone that feels this way that this money barely covers costs and does not begin to pay for the time of those that labor in these causes.

Why then do people spend so much of their time writing articles and programs, only to give them away? Why do others work far into the night to compile newsletters and program exchanges? It is because these people continue to have the spirit that started the free exchange of ideas when the first PET users knew little about their new machine. These people remember the thrill of learning a new technique and passing it on to a friend or a group of fellow users. Don't get me wrong, I am not starting a campaign to canonize these people. I just feel we would be in much worse shape if everyone felt they must be paid for everything they contributed. I also feel that authors should be rewarded in some way. Perhaps a small fee for submitting an article would be possible, but I prefer some kind of contest. Each issue the readers could vote on the best article, and the winning author would garner a small prize. In this way, each author has a chance to win, generating some suspense for both the author and the readers. However, I hope this remains subordinate to the willingness of most people to contribute ideas just to help out other users.

As we start a new publication, I hope everyone will realize they can contribute in some way. Articles and reviews are always needed, as are questions and comments. Many people just need to get over that initial "fear" of writing some of their ideas down. Other readers want to know if you have had good or bad luck with a particular product or company. Maybe you have learned something about a Commodore machine that you think is common knowledge but that others are unaware of. Remember that many users are just starting. Your niche may be to explain some very simple concept in a new way they can understand. Come join with us in the thrill of helping other Commodore users. Help make this magazine one which will continue to grow in quality and readership.

A Cheap PET to VIC to CBM Interface

by R. Dale Connely

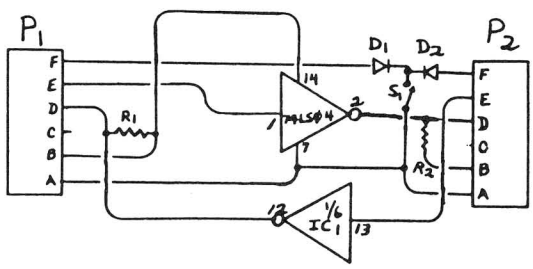
General Information

If you have ever spent 'hours' uploading or downloading a PET and VIC (or any other CBM computer), then this 'black box' may be for you. I own a VIC-20, a SuperPET and half a PET 2001-32N with Toolkit. For modifying PET programs for the VIC, a Toolkit or BASIC-Aid is essential. To take a favorite 7K program, add color, maybe paddles, joystick or elaborate sound, then crunch it all down to 3.5K requires that kind of help. After 5 minutes saving a program on one machine and loading it on another just to read ?LOAD ERROR, I start pulling hair.

The idea soon came: why not just connect the cassette ports of the two units together? That would cut the time to less than half and remove taped media problems. Well, of course, that didn't work, but while looking through some old PET User Notes, I discovered that Commodore's tape recording (saving) signal is inverted by the tape deck; that is, the highs become lows (or the 0's become 1's). However, the tape play (read) signal is NOT inverted. Hmmm.

Having attempted a PET interface once before, I developed a preference for SCHOTTKY ICs when dealing with PET's tape signals. Since A PET to VIC interface requires simple inversion, I chose a 74LS04 hex inverter. Its 5VDC power requirement is already available at the cassette port. Point of caution: it is neit her necessary nor desirable to join all six cassette lines from one computer to the other. The 5VDC line is used by the interface, but should be connected to only one computer. The 'motor' line is not used at all. The two 'sense' lines are buffered with steering diodes. I have often used this interface with reliability better than any tape has given, with no problems, even when left on for hours at a time.

Notes: Cassette port pin 'C' is not used.
DO NOT insert the IC until the socket leads are soldered.
Only two of the six inverters on the IC are used.
Connect the upper and lower pins of each connector contact pair.
Pull-up resistors may be soldered on the connector contacts.



LOGIC SCHEMATIC

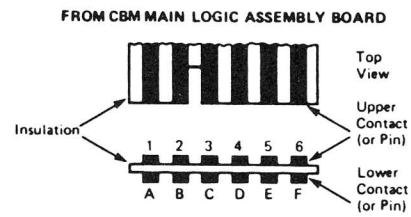


Figure 7.9. Simplified view of edge connector J3 with contact identification.

Note A-1, B-2, etc., imply a pin A to pin1, pin B to pin 2, connection. In some special units, pins 1 through 6 were not connected.

Pin Identification Characters	Label	Description
A-1	GND	Digital ground.
B-2	+5	Positive 5 volts to operate cassette circuitry only.
C-3	Motor	Computer controlled positive 6 volts for cassette motor.
D-4	Read	Read line from cassette.
E-5	Write	Write line to cassette.
F-6	Sense	Monitors closure of mechanical switch on cassette when any button is pressed.

Table 7.10. Second cassette interface port. CBM pin identification characters, labels and associated descriptions.

Assembly

Glue the IC socket to the middle of the perf board. Mark pin #1 on the top side and pins #1, #7, #8, and #14 on the bottom or pin side. Locate the diodes and resistors on the socket side so that the pins are near the proper pins on the socket. Incoming wires should also route through the holes in the card near the desired pins from the component side and be soldered on the pin side. Switch S1 is wired off the board and mounted in the case or box top. This is a 'dump' control, not a direction control. It should be mounted as an 'on-off' switch.

Instructions for Use

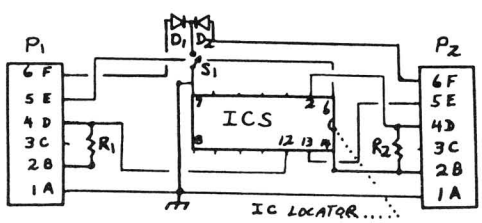
(1) Turn S1 off.
(2) Enter LOAD or LOAD"",2 on the receiving computer.
(3) Enter SAVE or SAVE"",2 on the transmitting computer.
(4) Both units are prompting now; turn S1 on and leave it on until the transfer is complete. S1 could be wired ON all the time if you remember to enter the LOAD command before the SAVE is begun.
(5) Check ST when the transfer is complete. You can even verify the dump!
(6) Remember: when dumping from VIC to PET you may have to reset the PET's memory pointers. If you have a Toolkit, use APPEND instead of LOAD. The most universal method I've seen for LOADing VIC programs on the PET is to enter from direct mode on the VIC: SAVE and on the PET:

```
FORJ=ØTO2: POKE4096+J,Ø: POKE 4608+J,Ø: NEXT
LOAD: LIST (if the program LISTs then you're ready, if not:)
POKE 41,16: LIST (if the program still doesn't list, then:)
POKE 41,18: LIST (program should have LISTed by now.)
```

If the program STILL fails to LIST, then you had a bad dump and should try again.

Parts List

Qty	Ref	Description	Shack's #	Price
1	ICS	IC socket, 14 or 16 pin	276-1999	.45
1	IC1	74LS04 hex inverter	276-1904	.79
2	P1,2	6/12 pin edge connector (cinch #250-06-90-170) or a 22/44 one cut in two	276-1551	2.99
2	R1,2	2.2Kohm resistors	271-027	.19
4-10'		5 conductor wire cable 18-22 AWG 7 strand with shield is best	N/A	
1	S1	SPST toggle switch	275-612	1.69
2	D1,2	1N4001 (most any diode will do)	276-1395	.49
1		2" by 3" box	270-220	1.69
1		1" by 1.5" perf board	276-1101	1.39



WIRING DIAGRAM

PET Hi-Res on the MX-80

by Frank Chambers

This report describes the high-resolution graphics printouts achievable on the MX-80 F/T Type II with a 16K PET and the Micro Technology Unlimited K-1008-6 Integrated Visible Memory hardware. The Type II is the British-market bit-image model, but similar results should be achieved with Graftrax on an MX-100. Traction-type paper drive is almost a necessity to obtain good paper alignment over any distance. The Type II and the MX-100 print an entire stripe of eight-dot-high bytes in one pass of the print head. This can be selected to be up to either 480 or 960 bytes in the case of the MX-80. The MTU hardware includes memory to store an entire screen's worth of 64000 dots, 320 wide by 200 high. These are also stored in groups of eight dots, but not in the same geometry as the printer. Instead, each byte corresponds to eight horizontal dots. These two schemes can be made to correspond to each other if the printout is oriented at 90 degrees to the screen display. The relations are shown in Figure 1 below.

```
12345
*....
*....
*....
*....
*....
*....
*....
*....
```

Fig 1a: Five bytes as the printer prints them

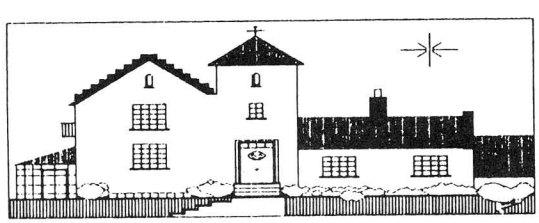
```
1       2       3       4       5
********.................................
```

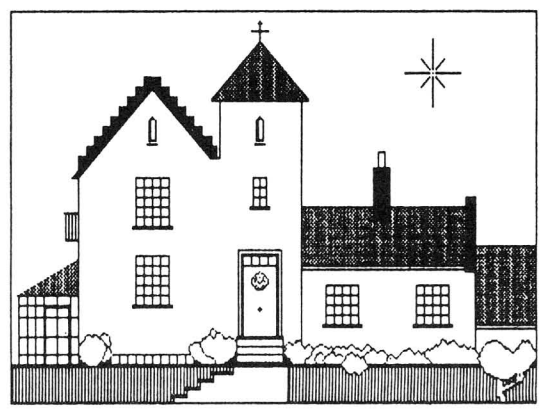
Fig 1b: Five bytes as the screen memory stores them

```
4 .................................
3 .................................
2 --------.........................
1 ********.........................
```

Fig 1c: Start in the lower left and scan upwards to make printer byte equal screen byte

The listing is a straightforward BASIC program for dumping such a display to the printer. It could be made much faster in machine language, but for my purposes, speed was no advantage. In my system the visible memory resides at $4000. This may be different in other installations, depending on memory capacity and intended use. To make a cassette or disk record of such a screen, use the monitor to record 8K starting at the visible memory address. This requires 33 blocks per screen for disk. Note that the printout area is not limited to one screen. The dimension corresponding to picture height can be up to 960 dots, limited only by paper width; the other dimension is limited only by paper length.





The program uses only dual-density mode and offers four aspect ratios through use of single or multiple line print. The effects are shown in Figure 2. It's very handy to be able to flip the screen (reverse the on-off status of all dots instantly). The software I use, offered by MTU's British representative, includes this feature - a great improvement over MTU's Keyword Graphics Package.

One control code reported for GRAFTRAX which my Type II does not have is one which homes the printing head after each line to make the printing uni-directional. This prevents vertical alignment from being adversely affected by play in the head drive. However, due to the slowness of the program, the head writes the 128 bytes stored by the printer, and then returns part-way while the printer register is being refilled, so it always prints from left to right. Vertical alignment is so much better than on Commodore printers which use an earlier Epson mechanism that there is no comparison!

```
100 REM: DENSE DUMP: VM TO MX PRINTER: F. CHAMBERS 11/81
110 REM: FOR 16K PET WITH MTU VISIBLE MEMORY AT $4000
120 REM: AND EPSON MX-80 TYPE II WITH IEEE INTERFACE.
125 REM: MODIFY MEMORY LOCATION BY CHANGING UL.
130 PRINT CHR$(147)"ASPECT RATIOS AVAILABLE ARE:
140 PRINT:PRINT "A: 1/2 TO 1
150 PRINT:PRINT "B: 1 TO 1
160 PRINT:PRINT "C: 1 1/2 TO 1
170 PRINT:PRINT "D: 2 TO 1
180 PRINT:INPUT"SELECT ASPECT RATIO (A, B, C, OR D)";AR$
190 IF AR$="A" THEN LSD=200:MSD=0:RP=1:GOTO 240
200 IF AR$="B" THEN LSD=144:MSD=1:RP=2:GOTO 240
210 IF AR$="C" THEN LSD=88:MSD=2:RP=3:GOTO 240
220 IF AR$="D" THEN LSD=32:MSD=3:RP=4:GOTO 240
230 GOTO 130
235 :
240 PRINT:INPUT"HOW MANY COPIES";NC
245 PRINT "OK."
250 POKE 48895,6
260 UL=16384: REM: UPPERLEFT
270 LL=UL+40*199
275 REM: SCAN STARTS AT LOWER LEFT TO SIMPLIFY READING BYTES
280 OPEN1,4
290 PRINT#1,CHR$(27)CHR$(65)CHR$(8): REM: SET LINE SPACING TO 8/72"
300 PRINT#1,CHR$(27)CHR$(67)CHR$(0): REM: SET 6" FORM LENGTH
310 FOR DWG=1 TO NC:REM: NUMBER OF COPIES
320 : FOR COLUMN=0 TO 39
330 : : AD=LL+CO: REM: ADDRESS IN VM
340 : : PRINT#1,CHR$(27)CHR$(76)CHR$(LSD)CHR$(MSD);
345 : : REM: SETS DOTS PER LINE
350 : : FOR ROW=0 TO 199
360 : : : ON RP GOTO 400,390,380,370
370 : : : PRINT#1,CHR$(PEEK(AD));
380 : : : PRINT#1,CHR$(PEEK(AD));
390 : : : PRINT#1,CHR$(PEEK(AD));
400 : : : PRINT#1,CHR$(PEEK(AD));
410 : : : AD=AD-40
420 : : NEXT ROW
430 : : PRINT#1,CHR$(10);
435 : NEXT COLUMN
440 : PRINT#1,CHR$(7)CHR$(12)
445 : PRINT:PRINT"COPY NO."DWG
450 NEXT DWG
455 CLOSE 1
```

Easter Dates

by Zoltan Szepesi

Easter is on the first Sunday after the first full moon of spring. The calculation of its date was the most important application of mathematics to nature in the Middle Ages.

Gauss gave a quite complicated algorithm for this calculation, and later Thomas H. O'Brien of Glasgow simplified it for the years between 1900 and 2099 inclusive. He memorized his procedure and was able to make the calculation mentally. I found his algorithm described by Martin Gardner in the Scientific American' Mathematical Games section (page 17, Feb. 1981) and programmed it in BASIC for the CBM/PET. This short program is shown below:

```
10 PRINT"(clr)  DATE OF EASTER FROM 1900 TO 2099":P=0
15 PRINT"  "
20 INPUT"(down)*TYPE THE FIRST AND LAST YEAR YO WANT   TO LIST (Y1,Y2)";Y1,Y2
30 FORY=Y1TOY2:N=Y-1900:P=P+1
40 N1=N/19:A=N-19*INT(N1)
50 B1=7*A+1:B=INT(B1/19)
60 M1=11*A+4-B:M2=M1/29:M=M1-29*INT(M2)
70 Q=INT(N/4)
80 W1=N+Q+31-M:W2=W1/7:W=W1-7*INT(W2)
90 D=25-M-W:IFP=1 THENPRINT"(clr)      DATES OF EASTER:Q"
100 IFP<=20 THENS=0
110 IFP>20THENS=20:IFP=21THENPRINT"SQQ";
120 IFP=41THENGOSUB160
130 IFD>0THENPRINTSPC(S);Y;": APRIL";D
140 IFD<=0THENPRINTSPC(S);Y;": MARCH";31+D
150 NEXTY:PRINT"(home)(21down)":END
160 PRINT"(down)PRESS ANY KEY TO CONTINUE"
170 GETA$:IFA$=""THEN170
180 P=0:Y1=Y1+40:GOTO30
```

A simple explanation of what is in this program is given below:

Statement 40: A is the remainder of N/19
Statement 50: B is the integer part of (7 x A + 1)/19
Statement 60: M is the remainder of 11 x A + 4 - B
Statement 70: Q is the integer part of N/4
Statement 80: W is the remainder of N + Q + 31 - M
Statement 90: D=25-M-W is the date in April, if it is positive;
If D is zero or negative the date is 31+D and is in March.

The program can display 40 years' Easter dates at once. If you ask for more than a 40 year interval, the printing stops after 40 years and continues when you press any key.

A Variable-Length-String Shuffler in RPL

by Tim Stryker

The article "Card Shuffle" by Bill Batcher in Vol.IV, No. 1 contained an interesting card-shuffling method attributed to Don Coscia. Coscia's method involves taking a string consisting of all of the card names, and pulling randomly placed cards out of this string, compressing the string in the process, until all of the cards are gone. I thought that was pretty nifty, because the other two shuffling methods that Batcher presented had definite problems: the first could (in principle) generate a truly random ordering but would take forever to execute, whereas the second could never be said to generate a truly random ordering, and would take quite some time to run even so. Coscia's method is easily seen to be capable of generating a truly random card ordering, and to run much faster than the other two. The only problem with his method is that it is incapable of handling character strings of variable length.

Thinking about this, I saw that all that would be needed to remove this restriction would be to apply his method to a set of fixed length pointers to strings, rather than the strings themselves. BASIC, however, makes dealing with pointers very difficult (in some instances, pointers can be simulated through array indices, but in this case would be clumsy at best). So, the question became: how best to implement Coscia's algorithm using pointers? Not in BASIC, certainly. Assembly language? Ugh. Pascal? I don't have it (who does, at 175-300 bucks a pop?), and even if I did, I wonder whether it is really set up for this kind of thing. Actually, since I have recently begun marketing a new stack-oriented language of my own called RPL, the conclusion was somewhat foregone. As it happens, RPL is specifically set up to facilitate pointer manipulation of all kinds. And it also happens to incorporate a very nice little primitive called "rotate" (courtesy of Ken Wasserman) which is ideal for the purpose of extracting just one element from a list and compressing it out of the list when done.

The accompanying listing shows an RPL program for shuffling and printing out the English-language names of the 52 usual playing cards. It times itself, finding that it takes just 1.36 seconds to shuffle and print out the whole deck. All but 210 milliseconds of this are taken by the printing operation itself (change what follows the dollar-sign on line 200 to ". NEXT . RETURN" to do the shuffle without printing the results and the process says "FINISHED IN 0.21 SECONDS"). This should be fast enough for most purposes.

Since most of you are not conversant with RPL, the listing will probably not make much sense to you. In general terms, the program mainline consists of nothing more than zeroing the PET jiffy timer ("0 142 !), calling the shuffle routine ("SHUFFLE &"), and reporting how long it took to execute (the rest of lines 110 and 120). The shuffle routine essentially just pushes the addresses of the 52 card-name strings onto its stack (line 190), and then proceeds to apply Coscia's algorithm to that list (lines 200 and 210). The heart of the shuffling process takes place in line 200 with the sequence "RND ; FN - (backslash) 2 + $", which extracts a random one of the pointers from the set remaining on the stack at that point. This sequence is enclosed between the first FOR in line 200 and the NEXT in line 210, which cause it to be executed just 52 times, each time extracting its new random card from a "pool" on the stack with one less card in it.

The above, of course, is hardly an "explanation" of how the program works. Hopefully, your appetite has been merely whetted and you now want to find out more about RPL. It really is a great language: you can get it to do a lot with very few keystrokes, but it doesn't cost you anything in execution time or object space to put in voluminous amounts of comments. It uses the ordinary PET screen editor for program entry, and it compiles very quickly. It can come with an integral "symbolic debugger", if you like, which makes program debugging a

breeze. It generates object code that is exceedingly fast and small, it's very easy to learn and use...and the list goes on. Drop me a line c/o Samurai Software, 14650 Bull Runn Rd 126, Miami Lakes FL 33014 if you are at all curious about it.

```
10 ********************************************************************************
20 *                                                                              *
30 *          VARIABLE-LENGTH-STRING SHUFFLING PROGRAM                            *
40 *      USING THE METHOD OF RANDON-DEPTH STACK ROTATIONS                        *
50 *  THE STACK ENTRIES BEING POINTERS TO THE STRINGS THEMSELVES                  *
60 *                                                                              *
70 *    BY TIM STRYKER 12/81 (WITH APPRECIATION TO DON COSCIA)                    *
80 *                                                                              *
90 ********************************************************************************
100 REM
110 TESTSHUF: 0 142 ! STRINGSEQ SHUFFLE & 142 @ INT "FINISHED IN " PRINT #
120 60 / STR$ PRINT "." PRINT 60 \ 5 * 3 / STR$ PRINT " SECONDS" PRINT STOP
130 REM
140    SHUFFLE IS THE SHUFFLE ROUTINE ITSELF. IT EXPECTS TO BE PASSED THE
150    ADDRESS OF THE ZERO-TERMINATED SEQUENCE OF STRINGS TO BE SHUFFLED,
160    AND IT THEN PRINTS OUT THESE STRINGS IN RANDOM ORDER, WITH COMMAS
170    BETWEEN THEM. IT POPS THE ADDRESS PASSED TO IT BEFORE RETURNING.
180 REM
190 SHUFFLE: 0 SETUP: 1 + ; PEEK IF ; # PEEK + 1 + % SETUP GOTO END
200 % . # 1 - 1 FOR RND ; FN - \ 2 + $ # PEEK 1 FOR # FN + PEEK 1 PRINT NEXT
210 . # FN - 1 > IF ", " THEN 13 1 END PRINT NEXT . RETURN
220 REM
230    STRINGSEQ IS THE SEQUENCE OF VARIABLE LENGTH STRINGS TO BE SHUFFLED,
240    IN THIS CASE THE NAMES OF THE CARDS IN A STANDARD PLAYING DECK.
250    THIS LIST MUST BE TERMINATED BY A ZERO.
260 REM
270 STRINGSEQ:("ACE OF SPADES" "KING OF SPADES" "QUEEN OF SPADES"
280 "JACK OF SPADES" "TEN OF SPADES" "NINE OF SPADES" "EIGHT OF SPADES"
290 "SEVEN OF SPADES" "SIX OF SPADES" "FIVE OF SPADES" "FOUR OF SPADES"
300 "THREE OF SPADES" "TWO OF SPADES"
310 "ACE OF HEARTS" "KING OF HEARTS" "QUEEN OF HEARTS"
320 "JACK OF HEARTS" "TEN OF HEARTS" "NINE OF HEARTS" "EIGHT OF HEARTS"
330 "SEVEN OF HEARTS" "SIX OF HEARTS" "FIVE OF HEARTS" "FOUR OF HEARTS"
340 "THREE OF HEARTS" "TWO OF HEARTS"
350 "ACE OF DIAMONDS" "KING OF DIAMONDS" "QUEEN OF DIAMONDS"
360 "JACK OF DIAMONDS" "TEN OF DIAMONDS" "NINE OF DIAMONDS"
370 "EIGHT OF DIAMONDS" "SEVEN OF DIAMONDS" "SIX OF DIAMONDS"
380 "FIVE OF DIAMONDS" "FOUR OF DIAMONDS" "THREE OF DIAMONDS" "TWO OF DIAMONDS"
390 "ACE OF CLUBS" "KING OF CLUBS" "QUEEN OF CLUBS"
400 "JACK OF CLUBS" "TEN OF CLUBS" "NINE OF CLUBS" "EIGHT OF CLUBS"
410 "SEVEN OF CLUBS" "SIX OF CLUBS" "FIVE OF CLUBS" "FOUR OF CLUBS"
420 "THREE OF CLUBS" "TWO OF CLUBS")
430 (0)
```

A Random Bit Generator

by Jim Fowler

Do you have any use for a really fast machine language routine that generates pseudo-random bits? It's not as good as a pseudo-random number generator, since it only outputs a bit at a time, but the bits are arranged in a sequence, so no pattern of bits predominates. That means 100 appears the same number of times as 101, 110, 111, and so forth. Eventually the sequence repeats. One nice feature is that you can assure the repeat length of the sequence is over some minimum value you select in advance. The longer the repeat length, the longer the routine, but even if the repeat length is long the routine is still quite short. I use a program with two constants, A and B. The values you choose for these will determine the repeat length up to 65,535 bits. If you want a longer sequence, let me know. I have the data to write one that will only repeat after more than an octillian bits!! Incidentally, there is a rigorous mathematical proof of the 'randomness' of these bits. The data for the constants (A and B below, but for longer sequences you may need more constants) comes from an article by E. J. Watson, "Primitive Polynomials (Mod 2)" in Mathematics of Computation, vol. 16, pp 368-369, 1962.

The program has a two byte shift register (X1,X2) you can locate anywhere convenient. You must seed this with a non-zero number. Then the sequence will be random once the leftmost bits are transformed. (This could take up to 9 runs of the routine). From that point on, it leaves the carry bit SET or CLEAR in a 'random' way. The accompanying table gives A and B values for the various repeat lengths, up to the maximum in a two byte register. Thus, seed the register, JSR to the routine and use the carry bit as random output.

```
033A             ; RANDOM BIT GENERATOR
033A             ; LEAVES CARRY FLAG 'SET' IN
033A             ; A RANDOM WAY AFTER EACH CALL
033A             ; SYS 916 FOR EACH USE
033A             ;
033A                       ORG $0392
0392             ;
0392             SHIFT1    BYT $05     ; SET UP TWO BYTE
0393             SHIFT2    BYT $22     ;  SHIFT REGISTER
0394  18                   CLC         ; CLEAR CARRY EACH TIME
0395  0E 93 03             ASL SHIFT2  ; SHIFT BYTE 2 OF REGISTER LEFT
0398  2E 92 03             ROL SHIFT1  ; ROTATE BYTE 1 OF REGISTER LEFT
039B  90 10                BCC END     ; IF CARRY CLEAR, BRANCH TO END
039D  AD 92 03             LDA SHIFT1  ; LOAD FROM REGISTER BYTE 1
03A0  49 08                EOR #$08    ; EXCLUSIVE OR W/ A FROM TABLE
03A2  8D 92 03             STA SHIFT1  ; STORE ACC AT REGISTER BYTE 1
03A5  AD 93 03             LDA SHIFT2  ; LOAD FROM REGISTER BYTE 2
03A8  49 80                EOR #$80    ; EXCLUSIVE OR W/ B FROM TABLE
03AA  8D 93 03             STA SHIFT2  ; STORE ACC AT REGISTER BYTE 2
03AD  60         END       RTS         ; RETURN TO CALLER
```

TABLE

Rep't length	A	B	Rep't length	A	B
255	1D	0	8191	0	D8
511	8	80	16383	0	AC
1023	2	40	32767	0	06
2047	0	A0	65535	0	2D
4095	5	30			

********** The Midnite / PAPER **********

COMING UP NEXT ISSUE

Companies have submitted the following programs for Review:

1) Marilyn Achtepohl is reviewing Norm Eisenberg's MASTER GRADES 2.1.

2) HES's VIC FORTH is available for review by a FORTH user who has a VIC.

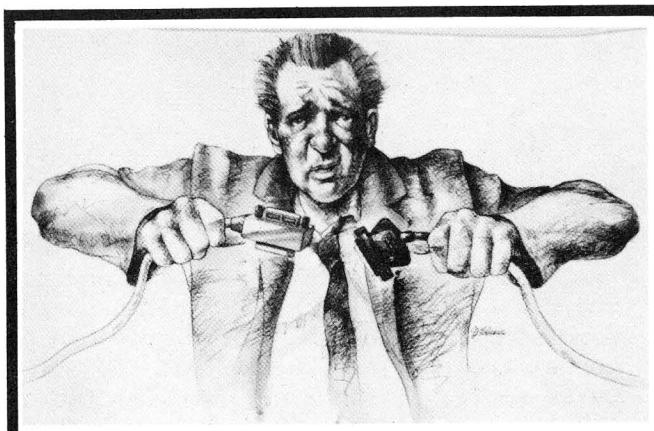
We have seen the following programs, but not yet reviewed them:

1) UCSD PASCAL 4.0 is out, but is unhappy with my graphic 8096.

2) VERSACALC exists, but has not yet been reviewed.

3) A legitimate VISICALC for the 8096 is a $20 upgrade--not yet reviewed.

We have lots of fine articles on hand for next time, including an errata sheet for the new Osborne/McGraw-Hill CBM Guide, courtesy of KRP.¬JS



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2. WORD PROCESSOR PLUS; $50. This is the same word Processor as above, with the following additional features: output to EITHER the VIC Printer or an RS-232 Printer, a disk file catalog, and a spool routine (formatted output to disk for later Printing). Included with the Program is MAIL LIST, below. Requires 12k and a disk drive.

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Catalog of software currently available for the VIC-20 computer. All programs are supplied on a C-30 cassette and run in the basic, unexpanded VIC-20 memory (approximately 3500 bytes free) unless otherwise noted.

1. BLACKJACK. Interactive program plays a version of the popular card game "21". Colors and sound. Player begins with $100.00 and attempts to parlay sum into huge fortune. Dealer pays double for "Blackjack" or "Five Card Charlie". Card-counting facilitated by use of 52-card color-coded decks, reshuffled after every eight hands or so. Automatically revalues aces down from eleven to one if total of player's hand exceeds 21. $7.95 plus $1.00 shipping and handling.

2. 8K - BLACKJACK. Requires at least an 8K memory expander to run on the VIC-20. As above, but more sound effects and colors. Also uses a 6-deck (312-card) shuffled shoe just as casinos do, and automatically counts the cards played; the "COUNT" command gives total number of cards played from the shoe and how many of each value card have been dealt. Makes development of a "card-counting" system to "beat the house" even easier. This version of the program even allows the player to cheat, by either seeing the next card before you draw, or by "peeking" at the machine's hand; since this may detract from the enjoyment of the game for some players, however, the special commands to cheat will not be included with the program unless specifically requested with your order. $12.95 plus $1.00 shipping and handling.

3. SOLITAIRE. This program allows you to play one of the many versions of the card game "solitaire" using your VIC-20 and your color television screen instead of a pack of cards. On your screen, the program prints out a 7-card by 13-card board (7 columns, 13 rows), and deals out seven cards face up in the top row. The player then goes through the pack of remaining cards to find ones playable on the board (red king on a black ace, for example). Select your play option (go on through the pack, place the card on the board, or move any card or string of cards in accord with customary playing rules). You've won when (and if) you've managed to build four ace-high strings (running from ace down to two) of alternating color. Program also allows play from two up if that is your preferred method— will even allow you to cheat! This one is hours of engrossing fun. $10.95 plus $1.00 shipping and handling.

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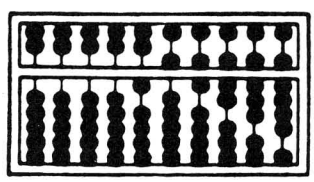

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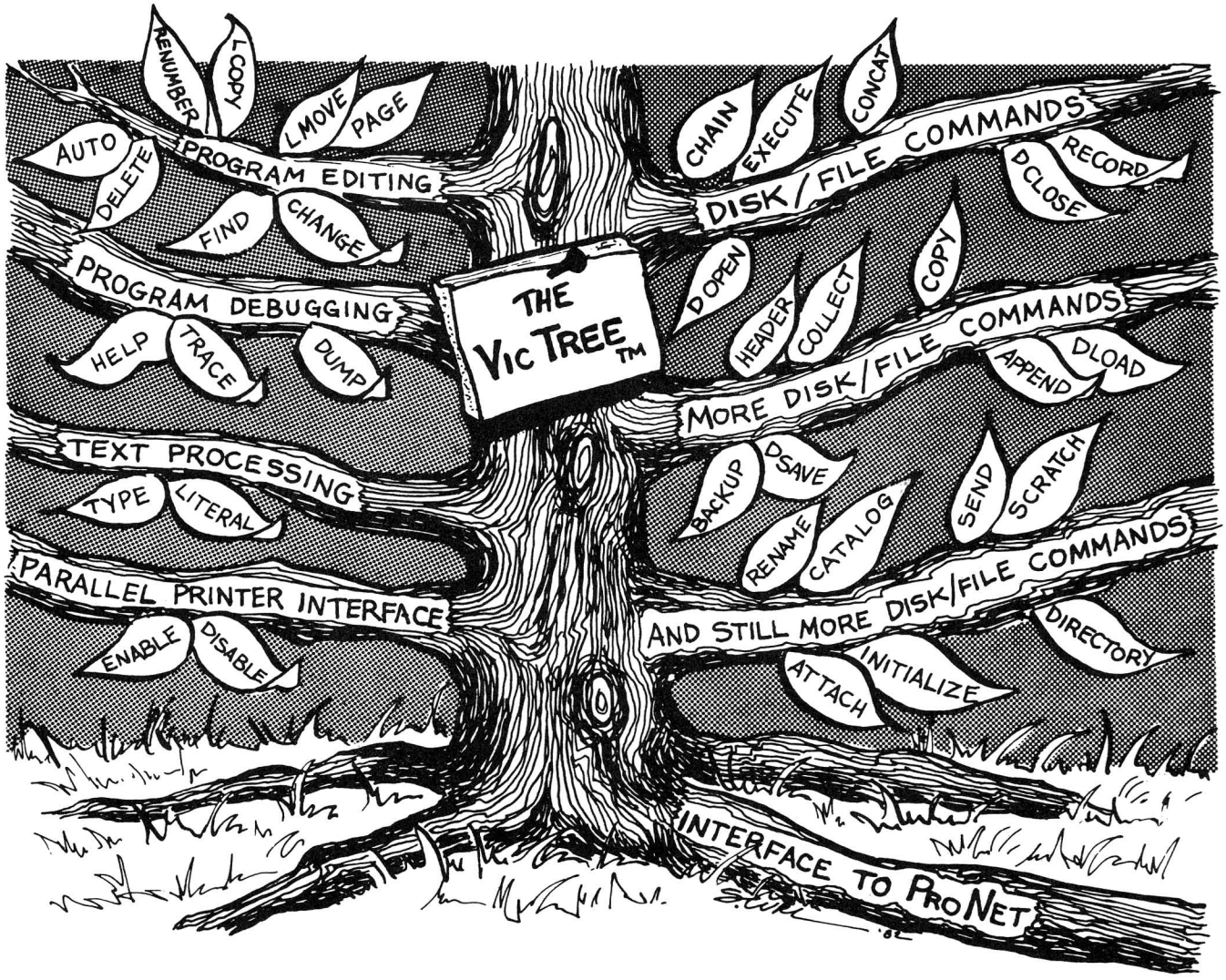

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